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September  
1989

# Radio Control CAR ACTION

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*Rocket Dragster, page 20*

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September 1989

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**ON THE COVER:** Center: Kyosho Hi-Rider (photo by Steve Pond). Above: Six-wheel Monster Mack truck built by Jon Freed and photographed by David Sproul. Top: Norm Ladue's Alien rocket rail making a quick exit (photo by Jim Shepka). Bottom: Dirt Oval Nationals in Burlington, NC (photo by Wally David).



# EDITORIAL

by CHRIS  
CHIANELLI



**W**E'VE ALREADY RECEIVED thousands of responses to the *Car Action* Readers' Survey, and by the time you read this, thousands more will, no doubt, have arrived. We take this survey business very seriously, and we thank you for your participation. The results will mold the editorial direction of *Car Action*, and you can rest assured that your vote has been counted. If other readers share your opinion, the necessary changes will be made to bring you a magazine that's tailored to popular interests. Once again, thank you for your help.

A lot of you out there are extremely sharp when it comes to the "Eagle Eye of the Month" contest; some of you, however, seem to conveniently lose IQ points when remembering what the prize is! Some of your letters were quite convincing; they end with sentences like, "Please send my new Clod Buster with radio overnight express so that I'll receive it in time for this weekend's events." Let me take this opportunity to quickly review what we're offering here! It *isn't* an '89 Corvette, a trip to Hawaii, a T-shirt, or a year's subscription to *Car Action*; it's a set of *Car Action* decals! Anyway, some of the letters were quite funny, and I have to give credit to some of you for at least giving it a try!

This month, we introduce a new column called "Truck Stop." It's by David Sproul, and it will address all aspects of monster trucking. Monster-truck madmen (and mad women!) are relentless in their quest to see how many drive wheels they can fit on their latest fat-wheeled contraptions. In this issue, David also reports on a 6WD (one-and-a-half Clod Busters) Monster Mack that's bound to make "Dirt Digest's" "Bad Brain" O'Brien green with envy. Hey Bill! That's three motors, six terra tires, three Black Magic reduction drives and 28 battery cells—four packs' worth! By the way, Bill, your rival in the Sick Machine category is called Jon Freed. He built the Monster Mack, and I understand it's undergoing further metamorphoses at his hands. Speaking of sick machines, I'd like to welcome aboard writer Jim Shepka, who reports on a rocket-powered rail called the Alien. See ya!

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**SUBSCRIPTION PRICES:**  
U.S. & Possessions (including APO & FPO):  
1 year (12 issues) \$25.00  
2 years (24 issues) \$47.00  
Outside U.S.:  
1 year \$35.00; 2 years \$67.00  
Payment must be in U.S. funds.

**RADIO CONTROL CAR ACTION** (ISSN 0886-1609) is published monthly by Air Age, Inc., 251 Danbury Rd., Wilton, CT 06897. Connecticut Editorial and Business Office, 251 Danbury Rd., Wilton, CT 06897. Phone 203-834-2900. FAX: 203-762-9803. Y.P. Johnson, President; G.E. DeFrancesco, Vice President; L.V. DeFrancesco, Secretary; Yvonne M. Micik, Treasurer. Second Class Postage Permit paid at Wilton, Connecticut, and additional Mailing Offices. Copyright 1989 by Air Age, Inc. All rights reserved.

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# LETTERS

## WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, IL; other mail addressed there must be forwarded to Connecticut, which leads to long delays.

## Eagle Eye of the Month

In your article, "Clash of the Titans" (July '89, page 42), you said you crushed five cars, but in the pictures you're only crushing three. How come?

MATT CICANESE  
Rohnert Park, CA

Very, very good, Matt. You win. Soon your mailman will be delivering your free Car Action decals to your door. CC

## Capable Conversions

On page 96 of your March '89 issue, John Gudvangen Manufacturing advertises a monster-truck conversion kit for the JR-X2, Ultima, RC10, and the Optima Mid. Are trucks built with these kits competitive with the Clod Buster or Blackfoot?

ADAM WINZENBURGER  
High Ridge, MO

Adam, it depends on what you want to use them for. If you want to enter truck-pulls, a Clod Buster is the way to go. The lighter conversions really shine when racing on off-road courses because of their lower center of gravity and generous suspension travel. CC

## South African R/C

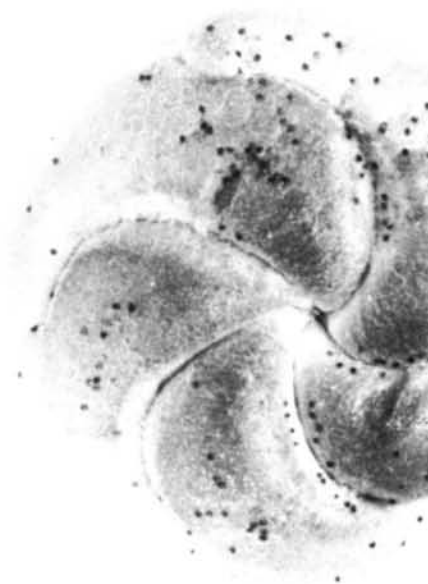
First, let me say that you have a great magazine. I receive it regularly and enjoy reading it. I want to find out more about Steve Topjian's article entitled "Breaker ONE-NINE" that appeared in your April '89 issue. Could you give me his address so that I could write to him for further info? Keep up the good work!

DEVLIN PHILLIPS  
Transvaal, South Africa

Devlin, I can't give out Steve's address, but I can forward your letter to him if you send it to me in care of Car Action.

CC

# ALL YOU NEED...





### Stowaway in Scotland

I'm in the Navy, and I'm currently stationed in Scotland. Since I can't go to the local hobby shop for advice or answers, I'm hoping that you'll be able to help me. My question is this: If you can put huge tires and big shocks on an RC10 and make it a monster truck, can you put an RC10-type drive train on a Blackfoot to make it really fast? I'm looking at the Track Master belt-drive transmission advertised on page 153 in your January '89 issue. I don't race, because there's no one here to race against, but if I practice enough while I'm here, maybe I can race when I get back to the good ol' USA. Your magazine has taught me a lot about

the sport, and I'm sure future issues will be even more informative. Any help you can offer will be greatly appreciated. Thank you.

By the way, if you want to know where my base is, take a look at a map of Scotland and go to the northernmost city—that's us. It's pretty isolated and there are no racetracks!

D.F. WARNER  
U.S. Navy, Scotland

*D.F., it's hard for the kit-based monster trucks to keep up with the RC10, Ultima and JR-X2 truck conversions in off-road-style racing. While the belt system you're referring to probably wouldn't work,*

*Track Master has just come out with a new Turbo Glide belt system designed specifically for the Blackfoot. This should really open up the high-performance field to a sizeable number of these trucks. With a little suspension work, you just might be able to surprise some of the conversion crowd with your "stock" monster truck. Keep looking west—we'll be waiting for you.*

CC

### Talk About Service

You're number one! After reading John Rist's "Scoping Out" on the BEC in your June '89 issue, I had some questions and needed some help on a DC power supply.

(Continued on page 10)



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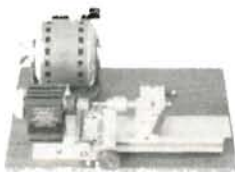
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# LETTERS

(Continued from page 9)

I wrote to John and, in a very short time, I had my answers (along with about 15 pages of photocopied technical material) to get me started on my power supply. This info cost John a dollar to mail and a few hours to prepare. The power supply works great, and, thanks to John, I was able to build it in a couple of hours with no problems. This man deserves a raise for his unselfish dedication to your readers.

You have a very happy reader here. I haven't missed an issue in three years, and I'll be a satisfied reader for years to come.

TONY RIEK  
Wildwood, IL

On behalf of John and Car Action, I'm glad we could help. CC

### No Half-Axes to be Found

Your April '89 Editorial talks about beginners getting taken by toy-like R/C cars, and you suggested that they check out a hobby shop first. I recently bought a used car called the Ishipla Monster. Well, I'm very upset, because it's developed problems, and the hobby shop can't get parts for it. My half-axes are messed up, and I need another set. Do you know of a company that sells parts for my car? I'd really like to stay with this hobby, maybe even enter some races, but I'm getting very disgusted.

DANNY JONES  
Oneonta, AL

Danny, I wish I could help, but I don't know anyone who distributes, sells or services your car or its parts. You're probably asking why I published your letter. I've received many letters like yours, but I've also received a few letters telling me that I was all wet when I addressed this problem in my April '89 Editorial. Printing letters like yours is evidence that the problem is real.

I'm going to try to get some information about Ishipla; any info will be printed

in the "Letters" section. In the meantime, don't let one bad experience put you off the best hobby that ever existed. CC

### Pop Quiz

I have three questions for you: 1. Will the Grasshopper Two differential fit the Frog? 2. Is it true that MRC is making a Frog II? 3. Is the Frog capable of taking the world title if it has all the right equipment?

Keep up the good work. Your mag is the best!

VERNON LEE PIPKIN  
Indianapolis, IN

No. 1: No!

No. 2: It's a rumor.

No. 3: Highly improbable (high center of gravity, limited suspension travel).

Thanks, Vernon. Let me know if I passed. CC

### Italian Hornet

I'm looking for another top for my Hornet. I had my heart set on the Lamborghini Countach, and I was wondering if you knew where I could get one. My second choice would be a Ferrari Testarossa. Thanks! I love your magazine!

LEAF AHERN  
Peterborough, NH

You're in luck, Leaf. BoLINK produces a Lamborghini Countach in 1/10 scale that should really dress up your Hornet. If you decide to go the Ferrari route, Parma makes a 1/10-scale Testarossa, and BoLINK has recently come out with the new Ferrari F-40. Send us a photo of your swoopy Hornet when you get it done!

RH

### What A Waste

I love your magazine! However, I was a bit miffed when I noticed that you were crushing Optima Mids and RC10s with the Royal Crusher (June '89 issue, page 37)! The next time you plan on doing this,

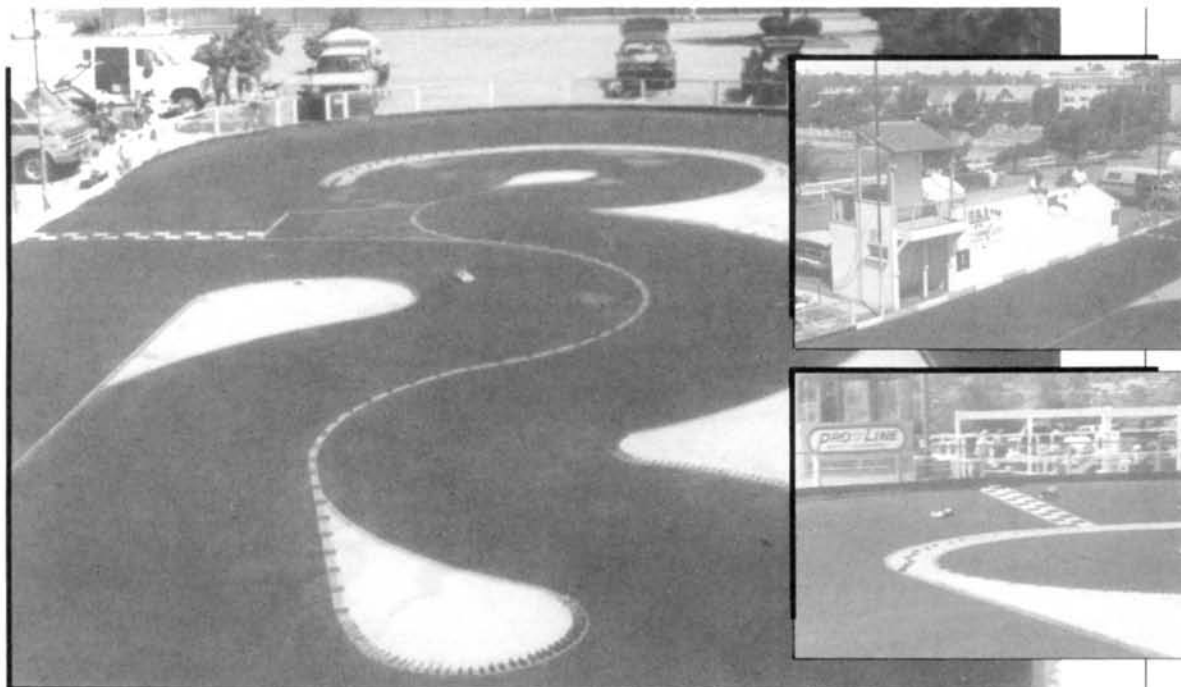
(Continued on page 14)



# HOT TRACKS

by DANNY BATINICH

**W**elcome to "Hot Tracks." Each month, we'll choose an outstanding track to feature in this column. To qualify, send in some high-quality, black-and-white photos of your track, along with a description (500 words or less), outlining why your track should be chosen. Send your entries to Hot Tracks, Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897.



## E&L Raceway, Del Mar, California

**O**nce one of the fastest dirt ovals in Southern California, E&L Raceway has followed the growing trend in R/C racing and has recently had its track paved with asphalt. The track is approximately 300 feet long, and it has a 12-foot-wide straightaway that leads to banked turns. Turns one and two are banked 10 degrees, and turns three and four are banked 5 degrees. There are pit spaces for over 300 racers, and the track is located in a complex that has a snack bar, a miniature golf course, a hobby shop and a driving range for golfers.

E&L Raceway is owned and operated by Eddie and Linda Perez of Oceanside, CA, and races are held every Friday night and on Sunday. Laid out in the infield is a road course that's exclusively for 1/12-scale cars. Even though the track has been paved for only a few months, the track records are ex-

tremely fast and will be very tough to beat.

Eddie and Linda Perez have operated E&L Raceway for over three years, and they're looking forward to success with the new racing surface. Since the change to asphalt, the track has been a popular facility and will probably become one of the prime pavement tracks on the West Coast. To make E&L an all-around racing center, there are also plans to build another dirt course in the complex.

As this year's racing continues, E&L Raceway will stand out among the paved-oval tracks on the West Coast. It's at 15575 Jimmy Durante Blvd., Del Mar, which is approximately 100 miles south of Los Angeles, CA. Eddie and Linda Perez invite you to meet the challenge of their asphalt oval the next time you're in the area. ■



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## LETTERS

(Continued from page 10)

send me the Mid or RC10, and I'll send you some junky car. OK?

**BRENDAN WILLARD**  
Los Angeles, CA

*Brendan, I wish you'd told me sooner.*

CC

### Frog Parts?

I have some very big questions, but you don't have to respond with a big answer. I have the Frog and it's really tricked out. It has a Thorp diff, Thorp Dog Bones, Tekin speed control and the Hot Trick Hop-Up Kit. My local hobby-shop owner told me that the car is no longer made. He also said that it's too heavy and basically a piece of junk, and that I should get an RC10. (This, after all the money I put into it, not to mention a Trinity Silver Dot Motor and full bearings!) But on the outdoor dirt track, I took 2nd place and beat a Turbo Ultima and an RC10. On the indoor track, I came in 3rd against a BoLINK Invader.

Will I be able to get parts for my Frog in the coming years? Should I get a new car? Most of all, can I even trust this hobby-shop guy when he says that my car is a piece of junk, or do you think he just wants my money?

Your advice means a whole lot to a kid like me. Also, thanks for putting the article about the Frog in your great R/C mag.

**BRIAN KERR**  
Willoughby Hills, OH

*Brian, between Tamiya and the after-market people, and given the number of Frogs around, I can't foresee problems in the parts area for a very long time. Now, to the question about whether or not your Frog is basically a piece of junk. Let me put it this way: It's apparent that you're a better-than-average driver. The cars you beat, the RC10 and Ultima, are, from a design standpoint, superior to the Frog; still, you beat them. If your car really was as bad as your hobby dealer*

*said it was, you'd have lost. Think how well you'd do with a later design. As for trusting your local hobby dealer, always be careful when you receive an opinion from the person who stands to receive your money, no matter what he's selling.*

CC

### Moon Racing

Your book is great, but I need further info on a different subject. Do you know of a kit or plan for a good-size Lunar Rover with Akerman steering? Thanks for any help.

**BILL MILLIKEN**  
Los Angeles, CA

*Bill, I suggest that you contact NASA; they must have a used lot with one or two low-mileage units left sitting around. At least they should have plans still on file. Seriously, can anybody out there help this guy? An R/C Lunar Rover sounds familiar, but I don't know why.*

CC

### Uncover the Cat

I think your magazine is great, and I've just become a subscriber. I'm anxious to get a look at Schumacher's Top Cat. In the January issue, Schumacher showed the Top Cat covered. I've just received the June issue, and it's still covered! Just when will the unveiling of the Top Cat take place?

**HENRY BAKER**  
Princeton, NJ

*Even if Schumacher doesn't uncover the Top Cat, we will—next month. In the next issue of Car Action, Rick Houle will be doing a full Track Report and will fully expose the Top Cat.*

CC

We welcome your comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, due to the tremendous number of letters we receive, we cannot respond to every one.

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# INSIDE SCOOP

by CHRIS CHIANELLI

The R/C CAR industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!



### BIGGER IS BETTER

Is bigger better? Judging by the looks of this monster of monsters, the people at Design One think so. The tube-frame design comes in a one- or a two-engine version, and the truck has been extensively tested by crushing Yugo cars.

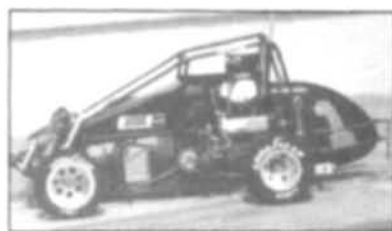
### KRAZED AT KYOSHO

There's been a massive security leak at Kyosho, and it has revealed many ongoing projects: A new Sprint Car, allegedly based on the Ultima, is code-named "Sideways," and another oval

project is a 4WD dirt-oval racer called the "Slingshot." Other round-the-clock developments include a .10 gas-powered ZR-1 Corvette, a new Ford body for the Big Brute and a Turbo Raider. These guys are indefatigable!

### SCALE SPRINTER

The 1/10-scale Outlaw Sprint Car and Midget from B&R Racing Chassis in Arvada, CO, are very realistic. Their chassis are made of brazed steel wire. The Sprint Cars are copies of Steve Kinser's Gambler and Sammy Swindell's Challenger, and the Midget is a Gambler copy. (Note the chain drive.) The Sprinters are RC10-adaptable, and the Midget should be available this month.



### GODZILLA AND E.T.

What do Godzilla and E.T. have in common?: the name "Trinity." Don Moncsko set new 1/4-mile records using Houge Enterprises' "Illusion" Top Fuel dragster. Powered by a Trinity 12-turn Godzilla, Don's rail set a new record of 1.97 ET.

Keeping the industry BUGGED, I'll see you next time—or sooner, if I catch you in my spyglass! CC



# PUBLISHER'S PAGE

By LOUIS DeFRANCESCO



**T**HE R/C CAR HOBBY is going through a rapid state of evolution at this very moment. The entry-level car boom has subsided, but we've seen much activity with the more advanced cars, including on-road cars, monster trucks and more scale-like vehicles. Competitive events are gaining in popularity, and the whole industry in general is poised for more growth.

While the unprecedented growth we've been experiencing over the past three years is unlikely to continue (over 100 percent a year for many), there's still much more potential. Radio control is evolving into a serious hobby and wasn't the fad some had predicted. Because of this, our hobby is receiving more recognition in other circles, including some of the prestigious full-scale magazines. The May issue of *Road & Track* featured a story about the Thunderdrome and R/C cars entitled "Scale Sensations," and the April issue of *Hot Rod* magazine (my favorite since 1968!) featured a story called "Full Speed 1/10 Scale." With more outside press like this, people will have a better understanding as to what the radio-control hobby is all about. This will help eliminate the "toy" stigma that has many times been equated with R/C. We need this heightened public awareness, and I want to personally thank the editors of *Hot Rod*, *Road & Track* and the other full-scale magazines who have featured informative stories on R/C.

As the hobby grows and evolves, we at Air Age will be there to address the needs of an ever-changing market. Our all-Monster Truck Special will be available August 22 and will be followed by our 1990 Buyer's Guide, which has a scheduled October on-sale date. This will be followed by our first annual on-road special, which will be released sometime early in 1990. And, as always, we'll be giving you all the quality information and entertainment you've come to expect from the monthly issues of *Radio Control Car Action Magazine*. ■



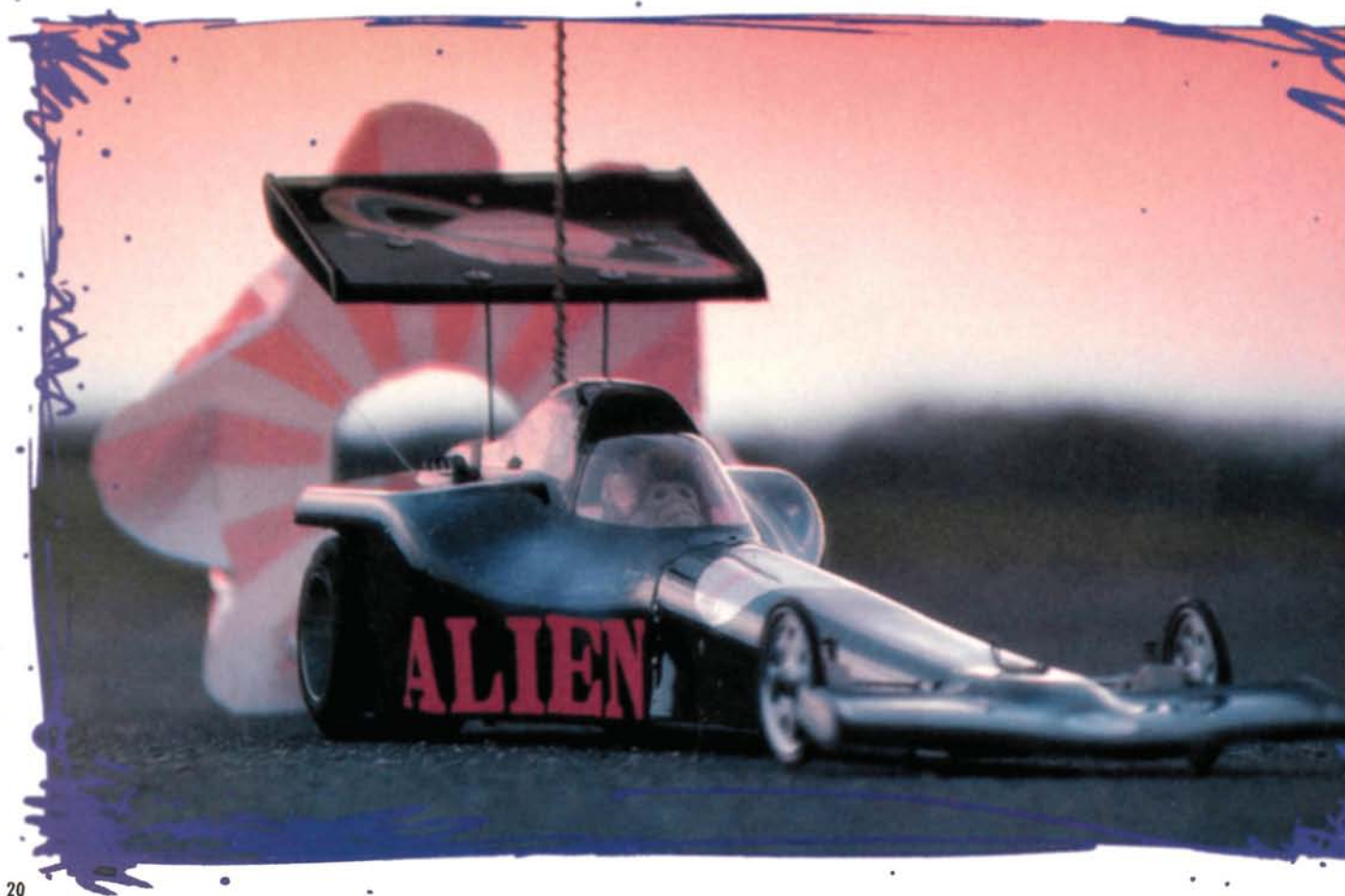




# ROCKET

**INSTANT ACCELERATION**

DRAGSTER





by JIM SHEPKA

**H**AVING PARTICIPATED IN various forms of scale R/C racing, I'm not easily impressed by the illusion of speed given by some of the latest products—well, at least, not until recently.

I was invited to our local R/C test track for a shake-down run of a scratch-built rail. Thinking it was just another electric car with mega-cells aboard, I reluctantly went along for the ride, but what I saw was *overwhelming*: a 3-pound  $1/10$ -scale rocket rail capable of covering the scale  $1/4$  mile in less than 2 seconds! Think about it: 132 feet in two ticks of a watch. That's faster than saying *Radio Control Car Action*. Blink, and you'll miss half the fun!

Norm Ladue is the proud owner and builder of this ground-guided cruise missile called the Alien. He's a metal fabricator/machinist by trade, and, with his interest in R/C racing, it was only a matter of time before he combined both work and play into his latest creation. Always looking for something new, Norm came up with an idea after watching Roger Gustin's Lava Machine rocket car blitz the  $1/4$  mile on ESPN one night.

Wanting to do more than just add a rocket motor to an existing chassis, he set out to design a functional, yet real-

istic, platform. Over 90 percent of the rail is scratch-built, including the front and rear hubs, both axle assemblies, motor housing and parachute blow-out tube. Weighing in at just over 3 pounds, the Alien is powered by three, solid-rocket engines, producing 27 pounds of thrust! The chute, which is located in the top center tube, is activated by the

lower motor upon burnout. The blow-out gas is forced through copper tubing, and it forces out the chutes at the end of the run.

After shake-down runs had been completed using one and then two motors, a final check of all components was made

before adding a third. The chute was repacked; the batteries were checked; the timers were set: 3, 2, 1...

NASA would have been proud of this one! In the failing light of dusk, the ground shook, the tri-motors roared to life, and the Alien was gone in a heartbeat. Ripping through the  $1/4$  mile quicker than my motor drive could capture the action, the flight was over almost as soon as it had begun. The bellowing chutes brought the fire-breathing beast to a safe stop.

Once the smoke had cleared, I soon took hold of my senses, looked to the stars that were now shining brightly and asked, "Can we be alone?"... ■



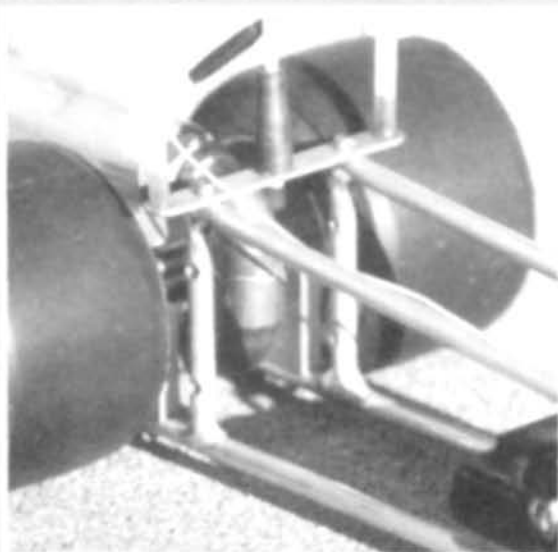
More detail photos on page 23



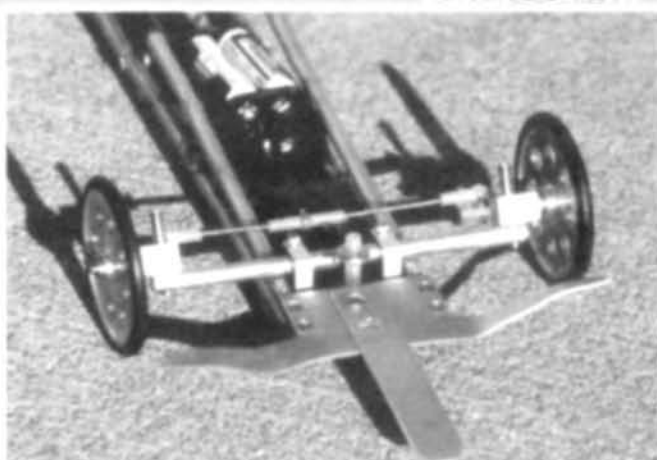
# ROCKET

## DRAGSTER

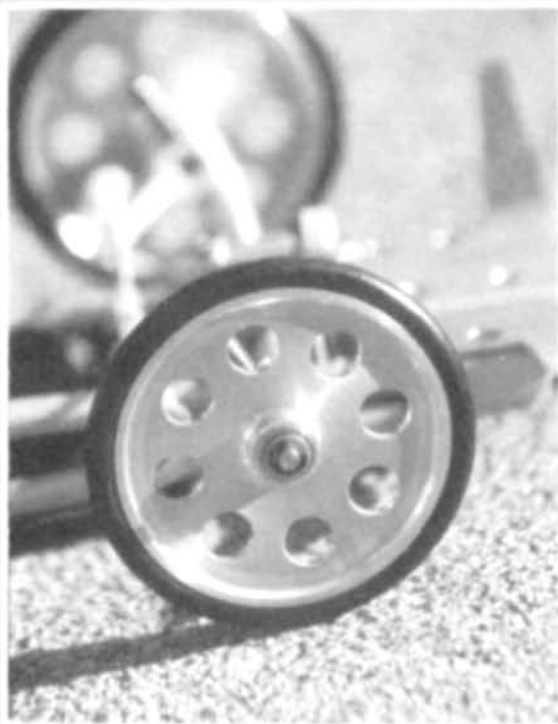
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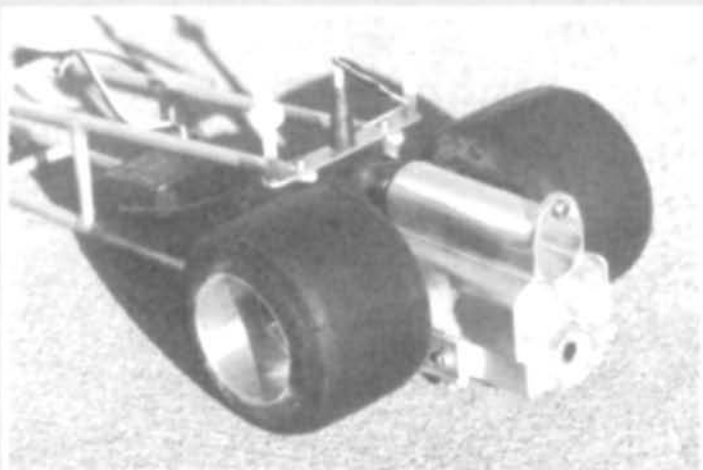
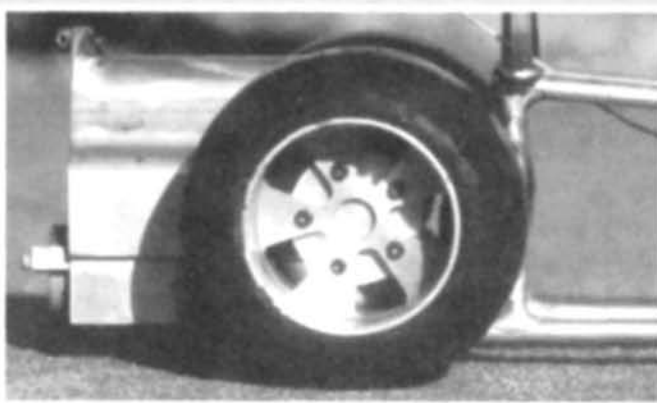
Rigidity and strength are vital for ultra-high-powered cars like this rocket on wheels. Ladue's hand-built tube frame rises to the occasion.



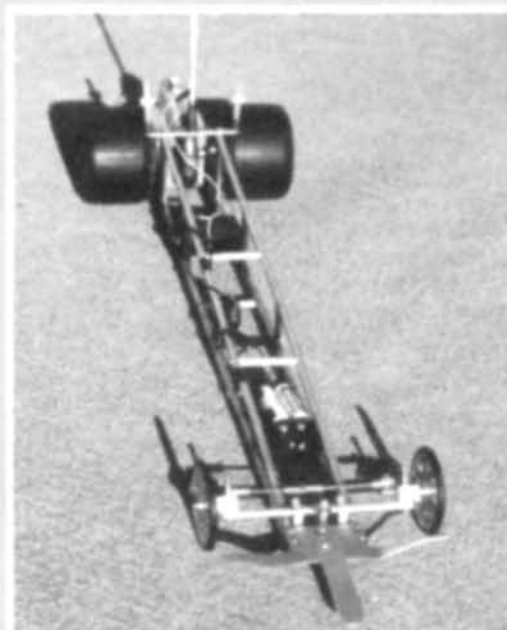
The front-beam axle is simple, strong, and permits high angles of caster to be dialed-in.



▲ The front and rear "mags" are machined of bar-stock aluminum.



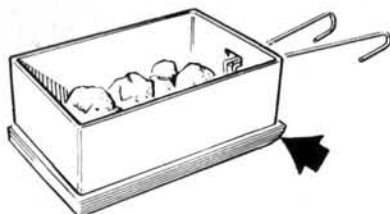
The three lower tubes hold solid-rocket engines that produce 27 pounds of thrust. The top tube houses the parachute, which is automatically deployed at the end of the burn.



With radio and engines, the complete chassis weighs only 3 pounds. Couple that to 27 pounds of thrust, and you have a ballistic power-to-weight ratio.

# PIT TIPS

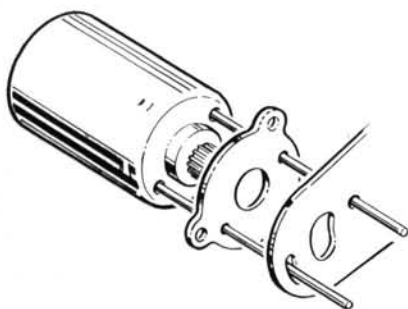
by JIM NEWMAN



## TRACTOR-PULL SLED

With this simple homemade sled, you can indulge in a little friendly competition. On a wooden base that has a bevelled front edge (see arrow), staple or nail a shoebox that has coat-hanger-wire hooks attached. Just load the box with rocks, then hook it to appropriate points on your truck.

*Sean Kelly, Rockford, IL*



## OPTIMA SPACER GUIDES

To keep parts aligned while you screw them together, insert two lengths of wire into the screw holes of the motor case, then through the spacer and into the motor-mount holes. Bring all three components together, withdraw one wire and insert a screw, then withdraw the second wire to insert the remaining screw.

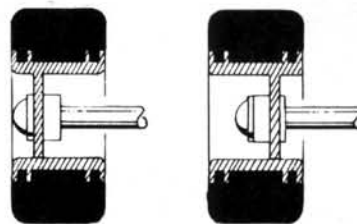
*Rich Lanoue, Tyngsboro, MA*



## OPTIMA BATTERY RETAINERS

Frustrated with supposedly "easy-to-use" battery straps, this contributor found some heavy-duty, 1 1/4-inch-diameter, rubber, slip-joint rings in the plumbing department of a hardware store. Inexpensive, and much tougher than rubber bands, they ensure that your battery won't fall out during a tough race.

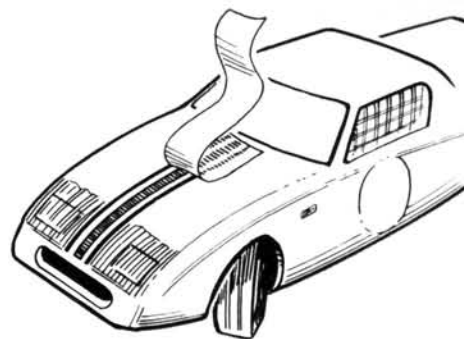
*David Mapes, Rockford, IL*



## WIDER WHEEL SPACING

Turning the wheels around (inside to outside, as shown) offsets them on their axles and gives the car a much wider track. But 4WD cars should use caution when running off-road, because 4WD components are now very vulnerable.

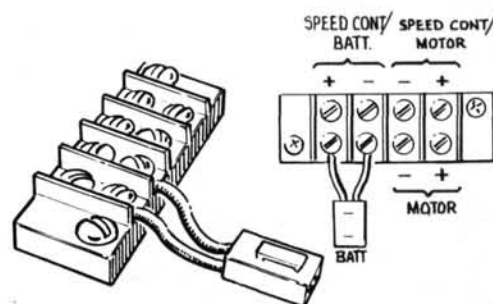
*Kevin Holt, Richford, NY*



## PRE-SPACED STRIPES

Here's a great easy way to put multiple stripes on your car. Buy auto striping, which comes in rolls with its own backing tape. Press it into place, then peel off the backing to leave the stripes exactly where you want them. The tape is available in many color combos.

*Paul Gamble, Bassendean, W.A., Australia*



## SIMPLIFIED MOTOR SWAPPING

This Radio Shack terminal strip is small enough to tuck into your car. Solder or crimp appropriate terminal lugs onto the wires; clamp them under the screws and, just by loosening the terminal-block screws, you'll be able to swap motors and plugs rapidly.

*Tom Attwood, Bushell Park, Saskatchewan, Canada*

*(Continued on page 26)*



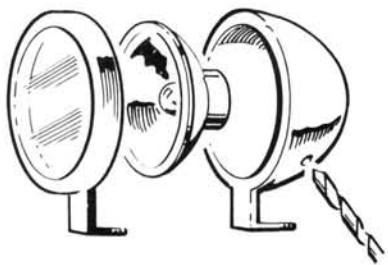
# PIT TIPS



## INEXPENSIVE AIR SUPPLY

Buying canned air for your airbrush can be expensive. Art stores selling airbrushes usually sell tire adaptors, too, and by borrowing the spare from the family car, or keeping an old inner tube for the purpose, you'll have a free air supply as close as the gas station where you inflate your tires.

*Bob Cates, Forest, Ontario, Canada*



## HIGH-POWER SPOTLIGHTS

Mark has modified the roll-bar lights on his Big Grizzly and they're bright. Drill out the stud from the back of each light, then open the front piece. Sand around the edge of a Mini Mag flashlight reflector until it fits inside, drill a small hole for the wires to exit the lamp body, add a mini switch, then hook up to a battery.

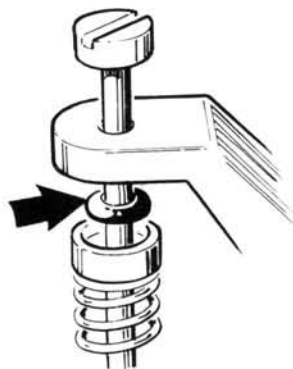
*Mark Lindsay, Ft. Bragg, CA*



## CURE TIGHT STEERING

Tight steering is frequently caused by a ball joint that's too tight. Disassemble the joint, then gently grip the threaded portion of the ball in a drill chuck. While the drill is spinning, carefully polish the ball with No. 600 emery paper until it's smooth and fits its socket.

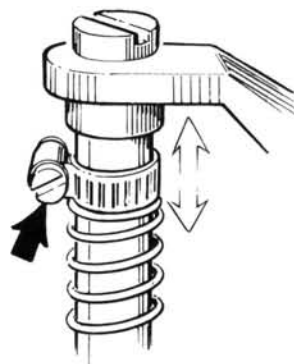
*Dean Simpson, Edmonton, Alberta, Canada*



## IMPROVED HORNET DAMPENING

By adding a nylon front-wheel bearing above each strut spring and putting a 3mm O-ring (arrowed) above that, this reader increased friction, and this substantially improved his car's dampening and handling through the jumps.

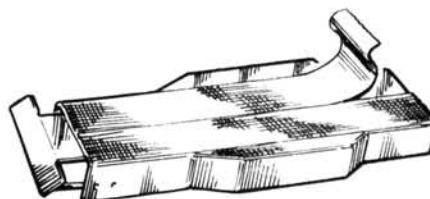
*Robert Chu, Brea, CA*



## ELIMINATE FRONT-END SAG

We're told this works well on the Midnight Pumpkin and Lunch Box front ends. Pre-load the springs by adding a 3/8-inch-diameter hose clamp around the shock-absorber body, above the spring. By sliding the clamp down and then tightening it to grip the shock, you can "tune" the suspension for improved handling by varying the amount of pre-load and stiffening the springs.

*Joe Marino, Mohnton, PA*



## PREVENT UNDERSIDE DAMAGE

In an effort to preserve the underside of his RC10 chassis, this enterprising owner covered the bottom with a layer or two of duct tape.

*Rob Brockman, Santa Maria, CA*

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.





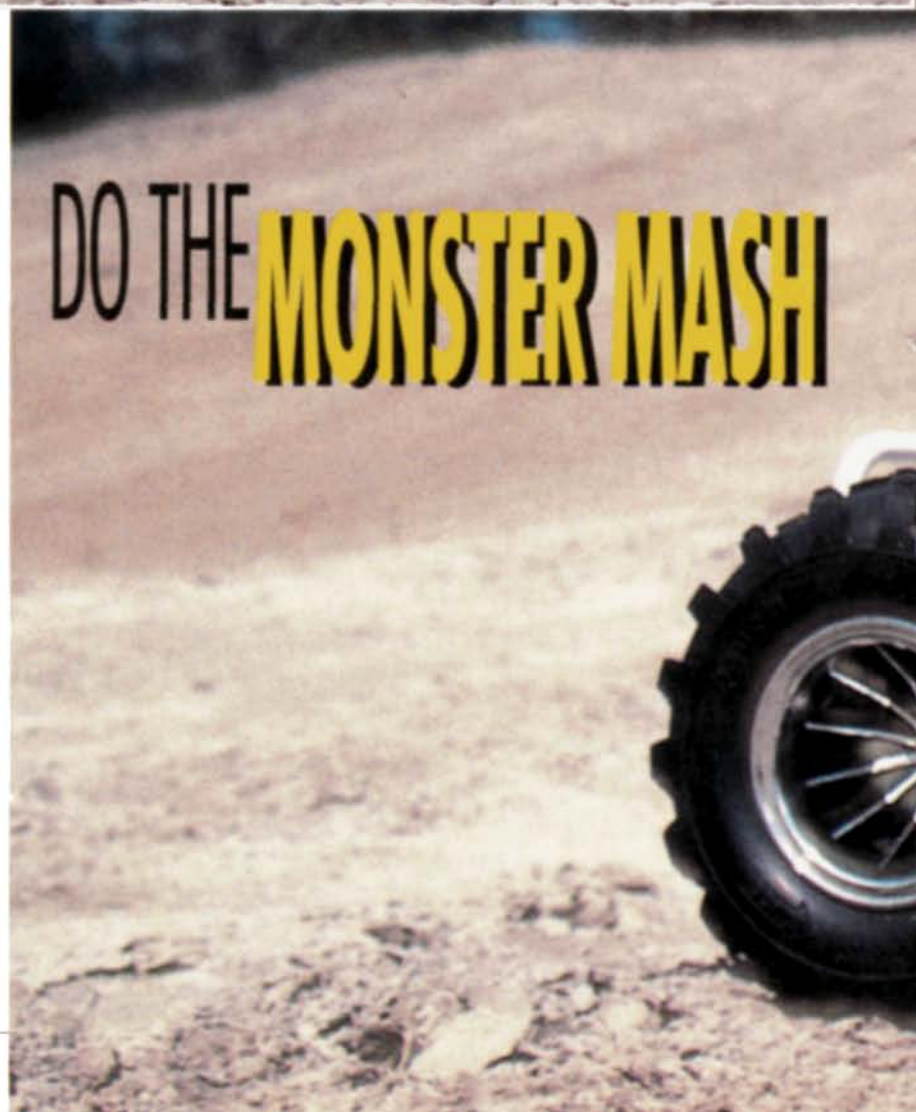
K Y O S H O

# HI-RIDER VETTE

by STEVE POND

**M**ANY OF THE early monster trucks were just pickup bodies on custom frames with big-block engines and 66-inch Goodyear Terra tires. The increasing number of monster trucks on the circuit has prompted many to build something different: car-bodied monsters, monster tanks and monster Jeeps. This diversity has captured the attention of motor-sport enthusiasts around the country and has created a boom in monster trucks.

As with other forms of full-scale racing, full-scale monster trucks have now reached the ranks of R/C enthusiasts. We see increasing enthusiasm for 1/10-scale monster trucks, the latest of which is the Kyosho\* Hi-Rider Vette. Despite its Japanese origin, the Hi-Rider Vette embodies the true American sport of monster-truck racing and car crushing. Fitted with a Chevrolet Corvette shell—the pride of the American sportscar lineage—









## HI-RIDER VETTE



*The Kyosho truck's unique chassis design protects its electronics from the elements.*

the Hi-Rider Vette is the first to don a car body. For me, this was welcome. It isn't that I'm tired of the trucks; I simply like an occasional change of pace.

Another American feature is a blown, fuel-injected V-8 engine nested in the center of the hood. Under the Corvette body is a chassis that's unique to Kyosho and designed specifically for monster trucks. The bathtub-type design includes a cover that fits over the electronics to protect against just about every evil (short of submersion in water). Attached to the chassis is 4-wheel independent suspension that, in most cases, promotes stability and improves handling. For dampening, Kyosho includes eight chrome-plated plastic shocks, and there are two on each wheel. The turbine-style wheels are also chrome plated and fitted with "box pattern" monster tires that are similar to those used on the Double Dare with a terra-type tread. Last, but not least, are the LeMans Stock 05 motor and the new Heavy-Duty Rotary speed controller.

Before assembly, check the instructions for the standard list of additional items needed, such as a 2-channel transmitter, a 7.2V battery and a charger. One item not included

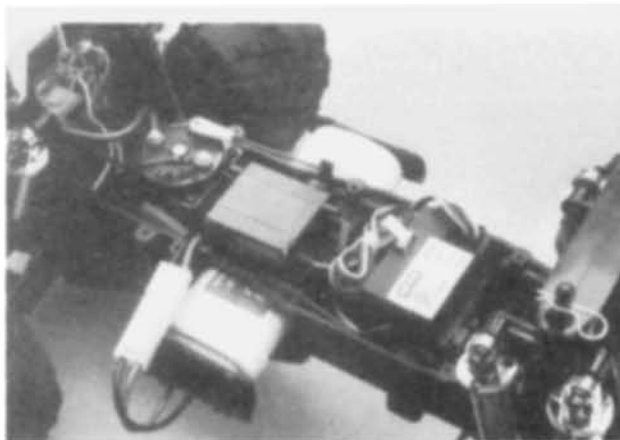
on the "required" list, but one that I strongly recommend, is a set of ball bearings. The kit does include plastic bushings, which is great if you plan on leaving the Vette on the shelf, but bearings are a must for reliable running.

**ASSEMBLY:** Kyosho's instructions are clear and simple, even for the beginner. Each step is clearly outlined with exploded-view drawings and notes in areas that require special attention. Although the written instructions are a little sparse, assembly should go smoothly if you follow the diagrams and notes.

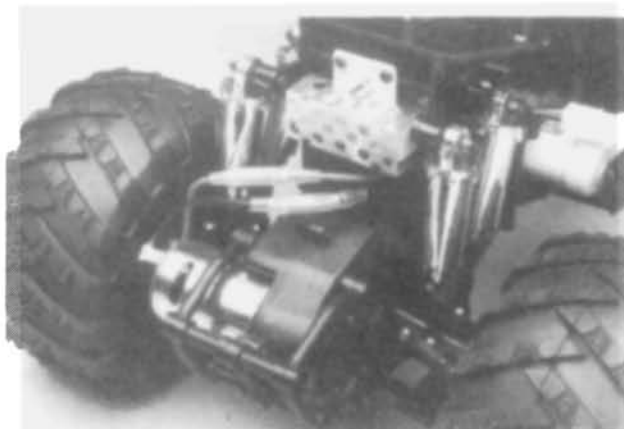
I don't have to repeat the entire instruction manual to help you through the assembly, but I recommend a couple of changes to improve

the performance of the Hi-Rider Vette.

The first change I made was in steps 4 and 5, where the steering servo is installed in the chassis. There are six holes



*Underneath the Hi-Rider's chassis cover, space is tight, but there's enough room for all the radio gear.*

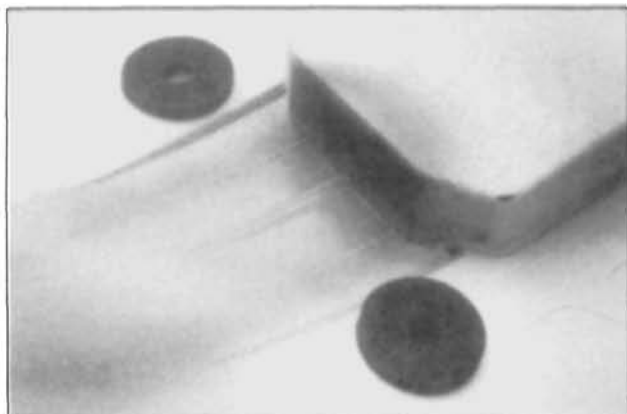


*The rear view of the Hi-Rider shows the powerful LeMans 05 Stock motor, which seems to outperform the standard Mabuchis. Also notice the dual friction shocks used for dampening.*

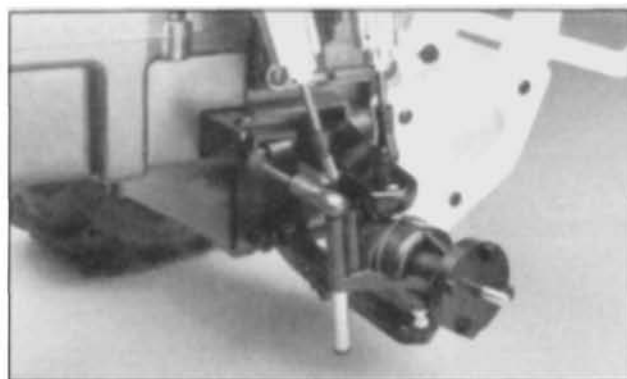


*To allow you to keep an eye on the speed controller and the neutral alignment, Kyosho has molded a "window" in the top of the chassis cover. If you plan on gettin' wet, you might want to put a bead of silicone around the edges.*

## HI-RIDER VETTE



A set of Dan's Body Foams protects the tremendous Motion Graphics paintwork.



With its floating front axles, upper and lower A-arms, and friction shocks (two out of three isn't bad!), the front suspension of the Hi-Rider Vette is similar to the rest of Kyosho's truck line. Note the long brass tube that acts as a travel limiter on the steering hub.

on the servo saver to mount the grommet (as it's called in the instructions), which fits in a slot in the servo slide rail. This servo slide rail is attached to the steering linkage, and the left and right movement of the servo permits steering. According to the instructions, the grommet should be installed in the upper center hole of the servo saver. After the servo has been installed, you're instructed to install two self-tapping screws on either side of the slide rail to act as travel limiters. Without these screws, the grommet, in its upper location, would pop out of the slot in the rail at the limits of the steering travel. No damage would result, but you'd have to slide the servo rail back until the grommet popped back into place. With the stopper screws in place,

the travel of the steering assembly is limited enough to prevent this from happening, but the steering action is extremely restricted.

I found a very simple solution: Install the grommet in the lower center hole of the servo saver. (Owing to different servo dimensions, results may differ when a radio system other than the Pulsar\* is used with the Hi-Rider Vette.) Remove the stopper screws that permitted lock-to-lock steering without the slider popping free.

The only other significant change I made on the Vette was drilling the backside of the wheels to permit

air to flow in and out of the tires. Without the holes in the back of the rim, the tires have an airtight seal, and this will cause the Vette to bounce excessively on rough terrain. With a Dremel tool and a small drill bit (about 1/8 inch), eight holes were drilled through the rear rim half and the inner ring, identified in the instructions as "wheel C." This allows air to flow out of the tire during impact when coming off a jump, and this will improve dampening.

With the chassis completely assembled, I just had to finish the precision-molded Vette body. According to Kyosho, the body is vacuum-molded with a new process that allows the body lines to curve inward. The previous process

(Continued on page 86)

## KYOSHO

### HI-RIDER VETTE

Type ..... Monster  
Scale ..... 1/10  
Sug. Retail Price ..... \$179.95

#### DIMENSIONS:

Overall Length ..... 18 inches  
Width ..... 12.125 inches  
Height ..... 10 inches  
Wheelbase ..... 11 inches  
Front Track ..... 8.75 inches  
Rear Track ..... 8.75 inches

#### WEIGHT:

Gross (w/bat.) ..... 6.0 pounds

#### BODY:

Type ..... Late-model Corvette  
Material ..... Lexan

#### CHASSIS:

Type ..... Tub  
Material ..... ABS

#### DRIVE TRAIN:

Type ..... Pinion/spur  
Differential(s) ..... Planetary gear  
Bearings/bushings ..... Plastic bushings

#### SUSPENSION:

Type (f/r) ..... Independent A-arms  
Dampening (f/r) ..... Dual friction shocks

#### WHEELS:

Front/Rear ..... 3-piece plastic

#### ELECTRICS:

Motor ..... LeMans 05 stock  
Battery Req'd ..... 6-cell 7.2V  
Speed Controller ..... 3 step forward,  
1 step reverse

#### OPTIONS AS TESTED:

Kyosho Pulsar 2001 2-channel radio

#### COMMENTS:

The Kyosho Hi-Rider Vette is easy to assemble, and the finished product can be very competitive against other monster trucks racing with stock hardware. The new heavy-duty speed controller is a tremendous improvement over the older models and, with proper care, it should never fail. The Vette, as with other Kyosho trucks, has a tendency to roll because of the high center of gravity. It could use some shorter, wider tires for more stable footing.



# TRUCK STOP

by DAVID SPROUL

## PULLING, CRUSHING AND TRUCKING IN CAR ACTION'S ALL-NEW COLUMN

**W**ELCOME TO THE first "Truck Stop"! These columns will be devoted to R/C truckin' of all types, but the focus will be monster trucks and truck pulling. I'll bring you news of events and info on new products and special trucks, tips on improving your truck for competitions, and other interesting items and stories.

R/C trucking has become an extremely popular segment of the R/C hobby, and it looks as though it will continue to be big. Of course, with all this interest comes competition among truckers. Pulling events have become the most popular, along with monster-truck (or "heavy metal") oval racing.

Also growing in popularity are monster-truck obstacle-course competitions with car crushing, jumps and/or slalom courses. As well as these, you'll find "mud bog" competitions—sometimes with some interesting "mud"!

Don't like to get your truck dirty? Try driving through a 12-inch-deep trough full of Styrofoam packing "peanuts"! It's probably just as challenging, but cleaner. If you're a die-hard mud-bog fan, though, stick with the *real* thing: build your mud-bogger to run in the dirty stuff and forget

about fancy paint, etc.

I'm sure R/C trucking still has possibilities that are, as yet, untapped. What about a door-slammer truck class in drag racing, or low-rider California street trucks with wild paint jobs and trick wheels? While semi-trucks aren't available in 1/10 or 1/12 scale at this time, they can be scratch-built and used for pulling or racing. Quarter scale also seems to be virgin territory, but watch out: Our Californian friends are heading in that direction. As well as the 1/4-scale Toyota Stadium Racer that's available from QRS\*, I've also seen a 1/4-scale pulling-truck prototype! While we won't all be able to afford these large-scale machines, I'm sure there's enough interest in this area to make it grow. How about a 1/4-scale monster truck with a 100cc engine running nitro? I can smell the fumes already!

The main appeal of R/C trucks is their versatility. They can be souped up, tricked out, chromed and *raced*! I used to race 1/12-scale on-road cars, and I still love them, but they wouldn't be able to run in my back yard! A truck can handle

grass, gravel, dirt, pavement, snow—almost anything! If you want to, you can use one truck for a number of things: Add some weight, install a high-torque motor, and go pulling; then swap to a high-rpm motor and knobby tires, and race or run an obstacle course. And, of course, you can just enjoy yourself in your back yard, if that's what you want to do!

I hope I've shed a little light on the truck scene and given you some new ideas. R/C trucking is limited only by our imaginations, and some of us have pretty *wild* imaginations! I'd really like to hear from all you truckers out there. Drop me a line to let me know what you'd like to see in "Truck Stop," and send me ideas and tips you'd like to share with your fellow modelers. I also welcome material for possible use in these columns.

Next time, we'll take a look at the R/C pulling sport and the vehicles used in it. Until then, keep the shiny side up and the dirty side down!

\*Here's the address of the company mentioned in this article:  
QRS (Quarterscale Racing Specialties, Inc.), 257 Garner Valley, Mountain Center, CA 92361.



Above: A Clod Buster takes out its frustrations in a crushing event. Right: Monster trucking attracts the creative types—three Clod gearboxes in a row make up this beast built by Jon Freed.



# READERS' RIDES

**W**elcome to "Readers' Rides"! We continually receive photos of readers' latest projects, so we've decided to start featuring some of the more innovative stuff to give all our readers a glimpse of these neat cars and trucks, etc. So here we go! If you want to be part of this new feature, send us a nice color photo of your project with a brief description, and we'll show it to the Ayatollah of Radio Controlla at the next editorial meeting to see if he'll publish it!

If we publish your photo, we'll give you a one-year subscription to *RCCA*, or extend your existing one, and you'll even be eligible for our "Readers' Rides Car of the Year Contest" in the fall of '89. Send your photos to Readers' Rides, *R/C Car Action Magazine*, 251 Danbury Road, Wilton, CT 06897.



train consists of two Futaba 111Bs connected to 14 cells that supply the Trinity Monster Horsepower Motors. To complete the realism, sound is furnished by an RAM modified motor and horn kit.

## INCOMING CLOD

How would you like *this* monster coming down on your pride and joy? Fernando Casas from Lawndale, CA, has equipped his Clod with an operational lifting front end and rear bed and a full complement of lights (including fog, brake and license plate). The power



## TICKLED PINK

Richard Wood of Moncton, New Brunswick, has built his '57 Chevy, "Tickled Pink," on top of a Big Grizzly. This big pink monster is powered by a LeMans 240 ST and controlled by an Aristo-Craft 0900 electronic speed control. But wait; where's the body clip? The hood scoop unhinges toward the front and is held down by a small screw in the back, revealing the body post. But what about the rear mounts?



## FIRE-BRAKING THRUSTER!

At this point, even Mission Control can't do much for Kevin Braden and his orbiting RC10. I hope re-entry didn't leave Kevin's A&L trailing arms, Losi bellcranks, Andy's A-arms and graphite chassis and shock towers spread across three counties. If anyone finds these parts within a 100-mile radius of Kevin's hometown of Costa Mesa, CA, please give him a call.





### PIECE OF CAKE

For two years, Brian Crane of Chetek, WI, has been honing his race talents with a Turbo Optima.

He finds it "very reliable and competitive," and, with its belt conversion, Trinity one-way bearings and Twister 401, "it can race with the best of them." Judging from this photo, Brian and his machine have come to know each other. Brian, maybe you can give Kevin "In Orbit" Bradin a few tips!



### BY LAND AND SEA

It seems that Richard Bayley of Quebec, Canada, has the best of both worlds: surf and turf. The Clod Buster delivers the Jet Stream 800 onto the water whenever the mood strikes. (It's nice to see Tamiya and Kyosho working together so harmoniously.) Richard's boat trailer is scratch-built, and we've asked him to provide more information about its construction. Stay tuned!

### TURBO TURF

Chad Wayne from Trevese, PA, writes, "I must commend you on the excellent photos in your magazine. Keep up the great work." We commend you, Chad, on your photo. Although Chad's Monster Beetle is completely stock (except for a LeMans 360ST), the car is still capable of stirring up lots of trouble. Chad adds, "Having my photo published would greatly inspire me, as I'm an amateur photographer." All we can say is, keep up your great work, Chad, and the chances are it will pay off.



### WAITING FOR PREY

Here's Mike Rydwell's stealthy Optima Mid SE poised for action. To ensure that Mike gets the jump on his victim, he's equipped the Mid with a Trinity Monster motor, SCR batteries, graphite chassis and a Novak speed control. Mike and his Mid live in San Bernadino, CA.

### FrogMoCo MUSTANG

This muscle-bound pony car and its mechanic, Ivan Diaz, hail from Los Angeles, CA. To ensure the car lives up to its namesake, Ivan has converted a Frog into a dragster named Wild Horse II and has equipped it with a drop front end, 9.6V pack, posi-traction and a Trinity Drag motor







# MONSTER MACK

by DAVID SPROUL



**P**ROBABLY everyone involved in R/C cars or trucks has modified a vehicle to make it

look or perform better than it did in its original state.

In fact, hardly anyone runs a car or truck that's entirely stock. There are also those who radically modify their vehicles to look entirely different from the way they started. Then there's a small minority of R/C modelers who aren't at all content with the original vehicle, and they prefer to scratch-build a car or truck from the ground up. Jon Freed, of Baden, PA, falls into this category.

Starting with a rusted-out Tonka toy truck cab, Jon began creating the ultimate  $1/10$ -scale car crusher: **Monster Mack**. After pirating not two, but three Tamiya\* Clod Buster gearboxes and six wheel/tire combinations, he began to assemble a totally new frame. Assembled in a ladder configuration, the frame is made of .25x1-inch aluminum bar stock. Jon made special mounts to mount the Clod Buster suspension arms and shocks. He also constructed aluminum trays to hold the



# CRITICAL MASS





## MONSTER MACK

**Frame** ..... Scratch-built/  
aluminum  
**Motors** ..... (3) Stock 05  
**Battery** ..... (4) 7-cell packs  
**Speed controls** ... (3) Tamiya  
mechanical  
**Gearboxes** ... (3) Clod Buster  
**Gear reductions** ... (3) Black  
Magic  
**Wheel/tire** ... (6) Clod Buster  
**Body** ..... Tonka Mack truck  
**Bed** ..... Scratch-built,  
aluminum and wood  
**Owner** ..... Jon Freed,  
Baden, PA



The Monster  
Mack's cab began  
as a Tonka truck.  
Jon Freed rescued  
the rusted-out cab  
and mounted it on  
top of a hand-built  
frame.

ones used on full-size trucks.

Jon found the Mack-truck cab wasting away in his basement. This old Tonka truck had seen many years of play, abuse and rust, and it required extensive reworking before it was presentable. After completing the restoration (which included fabricating a new cab front wall), the cab was painted red and yellow to resemble the full-size Mack trucks used by Jon's employer, Beaver Valley Builder's Supply. BVBS decals were hand-cut and applied to the doors; lenses were fitted to the headlights and 6V bulbs were installed to light them up. Hinges were mounted to the cab, allowing it to tilt forward for easy access to the electronics. Tinted windows were used for a custom touch and to hide the internal electrics.

Except for adding adjustable motor mounts and Black Magic\* gear-reduction units, Jon left the Clod Buster gear-boxes stock; he also retained the stock motors. The front axle is the only one that steers (as both rear steering assemblies are locked), and steering is handled by a Futaba\* 1/4-scale servo. For power, four 8.4V battery packs were wired to three Tamiya Clod Buster speed controllers, which are

(Continued on page 47)

batteries and electronic gear and mounted these inside the frame rails. For a cleaner look, the mounting holes were drilled and tapped to accept metric screws, thus reducing the number of nuts.

A tilting flat-bed was made of stained pine board surrounded by an aluminum framework. The bulkhead was formed from aluminum sheet and attached to the front of the bed, which was hinged at the rear. For easy access to the batteries and speed controllers, the bed is held in the "up" position by a telescoping rod that's secured with a body pin. The trick cargo tie-downs were hand-made from yellow shoestrings, and they're tightened by a ratchet mechanism that's similar to the





## THE ORIGINAL CLOD

by STEVE POND

**M**ONSTER MONARCH! Within weeks of its introduction, even the loyal owners of other trucks were hailing the Tamiya Clod Buster as king of the monsters. Its massive size eclipses that of all other 1/10-scale trucks, and its performance is just as impressive in the 4WD ranks. In short, this mammoth mauler has yet to meet its match!

The Clod features the popular twin-motor drive system that spins two completely independent axle assemblies. These axles are connected to the tub-style chassis with some fairly strong torsional-type suspension arms. Some owners have discovered that the attachment points for these arms need strengthening after a while, and this has led to the production of a number of chassis-strengthening kits. Apart from this, no other significant problems have been reported, and when you consider the weight that this truck carries, its durability is a real credit to its designer.

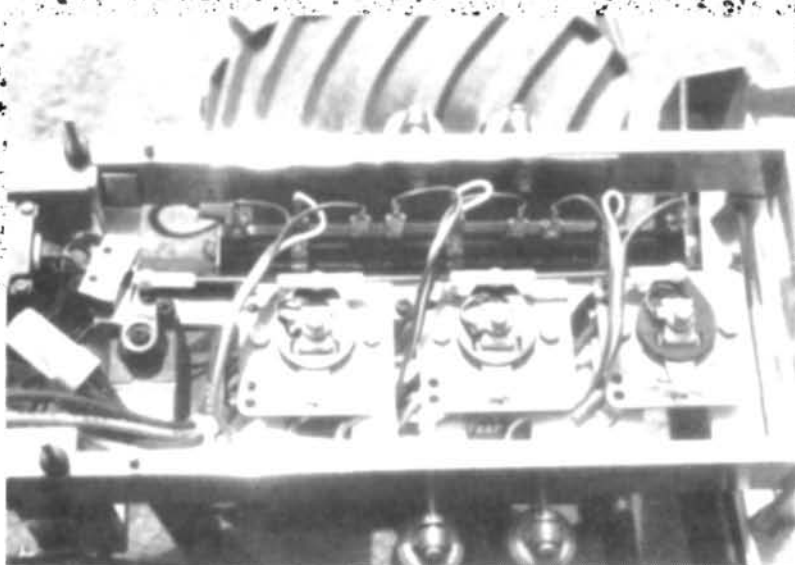
Just like the owners of so many full-scale trucks, Clod Buster drivers have dared to be different by modifying them—sometimes subtly, sometimes extensively—in an effort to call theirs *the* one



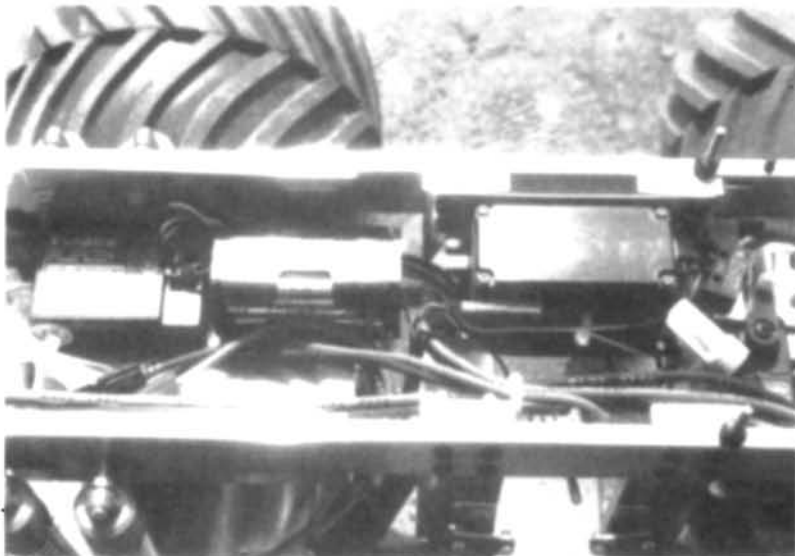
and only.

Using the Clod as a base for the Monster Mack, Jon Freed made maximum mods to produce his *wild 6WD* creation. While you might never *dare* attempt a project of this magnitude, the Clod is very fertile ground for some *wild* ideas! The sky's the limit with *this* sovereign superstar!

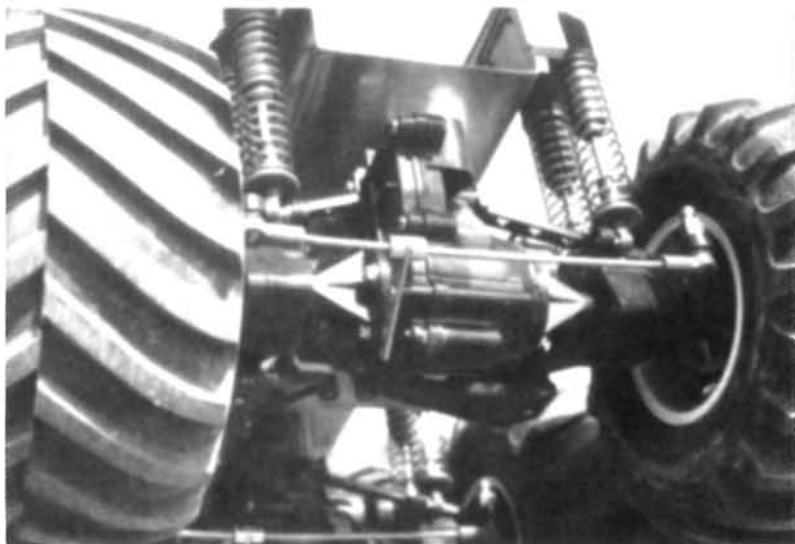




Three stock Clod Buster speed controls are wired to four 7-cell battery packs that are driven by a single throttle servo.



A 1/4-scale Futaba servo handles the steering, while four AA batteries power the on-board radio system.



Only the front tires handle the steering. All four rear steering hubs were locked off with this simple rod assembly and bracket.

## MONSTER MACK

(Continued from page 44)

activated by a single throttle servo. Extra-heavy-duty resistors from an electronics warehouse are used in place of the stock units. This Monster Mack beast is kept under control by a Futaba Magnum Sport radio system.

Jon is a member of the National Radio Control Truck Pulling Association, and he occasionally uses his

**... After pirating three Clod Buster gearboxes, Jon began creating the ultimate car crusher ...**

truck for pulling. The truck pulls for exhibitions only with 6WD, and he can competitively pull in the 4WD Open II Class (multi-motor) with one motor removed to make it 4WD. Monster Mack was entered in the 1989 Weak Signals R/C Expo static-display contest April 7 to 9, in Toledo, OH, and walked away with 2nd-place honors in the R/C car category.

As this project demonstrates, the R/C vehicles that can be created are limited only by your imagination! The Monster Mack can be summed up in one word—*awesome!*

*\*Here are the addresses of the companies mentioned in this article:*

**Tamiya/MRC**, P.O. Box 267, Edison, NJ 08818.

**Black Magic**; distributed by R/C Research Engineering, 7517 10th St., Stanwood, MI 49346.

**Futaba**, 4 Studebaker, Irvine, CA 92718. ■

# SCOPING OUT

by JOHN RIST

## COMPUTER TECHNOLOGY MAKES THE DIFFERENCE IN PDI'S DRAG MICRO ZETA

**E**XPENSIVE, BUT IS it worth it? PDI's\* Drag Micro Zeta FET speed controller costs more than conventional speed controllers of the same capacity because you must buy two units. First, of course, you buy the speed controller itself, and then there's the additional cost of the programmer. If you plan to run several Micro Zeta speed controllers, you need buy only one programming unit, and a racing team would obviously be able to share one.

This controller's main feature is that, before it can be used, it must be programmed with the following features:

- Start of forward trigger travel
- End of forward trigger travel (90-percent point)
- Start of linear braking point
- Start of 100-percent braking point
- End of brake trigger travel (100-percent brake)
- Trigger response curve (choose one of nine)
- Acceleration rate (choose one of 16)
- Brake response (choose one of 16)

The five settings that involve the trigger need only be set once when you match the controller to a transmitter/receiver combination. To keep the car dialed-in, the trigger, acceleration and brake responses could, and *should*, be adjusted to suit changes in track or car conditions. The generous number of response curves allows fine-tuning to almost any track/car combination. To say the least, this speed controller is *programmable*! How Product Design Inc. managed to do this doesn't really matter to most of us *hot* car drivers, but it was accomplished by using a microcomputer chip that has EEPROM (Electrical Erasable, Programmable, Read Only Memory) along with ROM (Read Only Memory) right in it. The main program is stored in the ROM, and the user's input (trigger set-points and function curves) are stored in EEPROM. Both memories retain everything when power is turned off. Using these two blocks of



*PDI's unique programmer (on the left) is used to program the Drag Micro Zeta's on-board computer, and you thought we only raced toy cars!*

memory, the microcomputer chip boots up each time a new battery pack is inserted, and it's ready to respond to every throttle command. With a microcomputer chip, a whole host of things can now be accomplished with programming, e.g., the Micro Zeta's ability to measure the width of the incoming receiver pulse and to reject any that are outside the normal trigger range. If the information from the receiver is faulty for more than a second, the speed controller shuts down, and this prevents "runaways."

Enough engineering double talk; the question is, *how good* is the Micro Zeta speed controller? To answer this question, I went to the "Scoping Out" lab. My lab setup consists of an oscilloscope, a digital voltmeter, a resistor load bank and a 6V 30-amp lab supply. The oscilloscope is used to monitor the controller's output to guarantee that it's fully on. The digital voltmeter is used to take all the voltage-drop readings and to verify the current meter's reading. The resistor load bank is a bank of 40, 12ohm 5-watt power resistors, which can be switched on and off one

at a time to vary the load between .6 amps and 20 amps. In series with the resistors is a 25-amp Simpson current meter and a 1-percent .01ohm resistor. By measuring the voltage drop across this resistor, the current-meter reading can be double-checked.

Of course, the lab supply gives me the test voltage. Following the instruction book, I connected the Micro Zeta speed controller to my test setup. PDI didn't provide a picture showing the complete setup (battery, receiver and speed controller hooked together), but the picture of the speed controller and the verbal description were adequate. *Warning: Read the instruction book!* Because of its programmable features, this speed controller is different from all others, and before I could get it to work *at all*, I had to read the book.

The first thing you'll notice is that this speed controller has no adjustment pots on its face. All the adjustments are made by using the programming unit, and although it isn't difficult to program the Micro Zeta, there's no room for error. For



## Test Data DRAG MICRO ZETA

### DIMENSIONS:

Height .....	0.70 inch
Width .....	1.40 inches
Length .....	1.50 inches
Weight .....	2.0 ounces
Access to Controls .....	Hand-held programmer
Ease of Adjustment .....	Good

### ELECTRICAL: (Manufacturer's Specs)

Max. Voltage .....	24 volts
Min. Voltage .....	6 volts
Max. Current Forward .....	995 amps
Continuous-Current Forward .....	210 amps
Fuse .....	Automatic
Max. Resistance .....	4 milliohms (.004ohm = .004 volt/amp = .048 volt at 12 amps)
Price .....	\$199.95

### TEST PARAMETERS:

Voltage .....	6 volts
Current .....	12 amps
Voltage Drop .....	.07 volt
Max Resistance .....	.0058ohm

### COMMENTS:

PDI's programmable features really work. The Drag Zeta's soft braking action can work on a high-speed oval that doesn't require much braking. I didn't care for the round-hole toggle-switch mounting system. The Drag Zeta has as low a resistance, as I feel it can be achieved with a six-FET speed controller.

instance, the trigger's full-speed set-point must be programmed before the start-of-speed set-point can be set. I started with the transmitter-throttle reversing switch in the wrong place, so I kept getting the pesky flashing-LED error message every time I tried to input the first program step. Other things to watch very closely are the open/closed designations associated with the eight program switches. PDI does give specific combinations of "open" and "closed" for every programmable function, but it's easy to make a mistake when setting eight *small* switches. I would have preferred a larger programmer with perhaps two 16-position rotary switches instead of eight rocker switches. I'm sure the present arrangement results from PDI's desire to keep the cost down, and it does work, but you must take the time to read the book.

Anyway, I admit I had trouble getting the programmer to work, but when I had made it through the procedure once, subsequent function re-programming was quite easy. Removing and inserting the battery (power down, power up) didn't upset any programs, and this means that when you've programmed the Micro Zeta, it behaves much like a conventional speed controller.

I adjusted the resistor load bank to the 12-amp level. Pressing the trigger and watching the speed controller's output on the oscilloscope revealed its very smooth throttle response and showed that, as programmed, it was fully on at the 90-percent throttle point.

Next, I measured the voltage drop. On a racing-style speed controller, i.e., one without reverse and without a battery or motor connectors, I take voltage readings by inserting needle probes 2 inches from the controller. The 2-inch length was chosen to ensure a fair comparison, because this is the length of wire required to hard-solder a speed controller into a car, and all the racing speed controllers have a lead that's at least this long. The volt-

age drop was determined to be .07 volt at 12 amps, yielding an "on" resistance of .0058ohms. This is a higher resistance than the .004ohms stated in the Micro Zeta brochure. For consistency, all manufacturers exclude the resistances associated with the printed-circuit board, the solder joints and the wiring and give only the resistance of FETs. I have to rank the Micro Zeta speed controller's resistance as low, as you can achieve it when using six FETs in parallel.

Next came the heat-build-up test, during which I let the controller cook at 12 amps for 15 minutes. No heat sinks or cooling fans are provided. After 15 minutes, the FETs were considerably cooler than I was expecting them to be; in fact, they were only slightly warm. This low

heat build-up verifies the low "on" resistance of the Micro Zeta's FETs.

For my final test, I jammed a screw-driver across the output to simulate a jammed motor. The sparks flew, but the Micro Zeta survived. This controller seems to be bulletproof!

Next, I obviously wanted to try out the Micro Zeta in a car. This presented a slight problem, because I don't have a dragster, and this is the *Drag* Micro Zeta. PDI's description of its Zeta controllers points out that the major difference between the Pro Zeta (which is intended for tight, off-road racing) and the Drag Zeta is that the Drag model can take more cells (Drag: 20 cells; Pro: 10 cells) and has a softer brake. The milder brake is ideal for controlled braking at the end of high-speed runs, but it isn't strong enough for tight roadcourse braking. The programming features are the same on both models.

My local racetrack is a fairly open, flat, dirt oval that requires very little braking, so I decided to try out the Drag Zeta in my Ultima. The mounting presented no special problems, but I don't like the round hole you need to mount the on/off toggle switch. This is the only feature that didn't make sense to me. My experience and reading on the subject have led me to the conclusion that slide switches are less susceptible to vibration than toggle switches, and a slide switch fits the existing hole. The switch did work, however, even if it was a pain to mount.

With a charged 7-cell battery pack, Twister modified motor and Drag Zeta installed, I was ready for fun. First, I tried to run the car in the road at the front of my house, but this was *scary*, because as set up, the car was *very* fast, and the Drag Zeta's brakes aren't strong. I did try several of the program curves and was quite surprised at the range of "personalities" that could be programmed into the car. (By then, I found programming quite easy.) It really isn't difficult; you just have

# Twister

by DAN WILBANKS

## OFF-ROAD CHALLENGE



*Participants had an excellent view of the track from the drivers' stand. The announcer and the computer operator also worked from a raised platform, and this made their jobs much easier.*

## Twister hits the Bay area

**T**HE FIRST ANNUAL Twister Off-Road Challenge was held in Livermore, CA, at the 15,000-square-foot Hobby Haven Indoor Raceway. Over 232 competitors from as far away as Nevada and Southern California competed with locals from the San Francisco Bay, Sacramento and Livermore Valley areas. Participants in the two-day event competed in four off-road classes: 2WD Stock, 2WD Modified, 4WD Stock and 4WD Modified.

### Course Design

The course was designed by Lenard Smith of Hobby Haven Raceway, whose goal was to design what he considered to be a pure "driver's course": one that not only requires a fast car, but also requires the drivers to make quick maneuvers around successive high-speed turns and over multiple jumps. While the triple jumps seemed to be the most intimidating, turn one proved to be the spoiler, especially on opening buzzer dashes. At times, four or five cars piled up in spectacular crashes as they tried to enter the corner together.

### The Challenge

During the first day's 29 qualifying heats, competition was close. Under the watchful eye of their founder, Mike Walker, the Twister racing team was there to test new designs and match their skills against those of the local drivers. During the Challenge, Walker was pleased to announce his sponsorship of a local racer, Jon Anderson of Sacramento, who's now on the Twister racing team.

Also taking the Challenge was Eustice Moore Jr., owner/designer of MIP Racing Products. As a manufacturer of drive-trains and related accessories, Eustice has been involved in the industry for over 12 years. His ability as a driver is reflected by his membership on the Reedy Modified Racing Team.

At the end of the first day, the local racers were leading as everyone prepared for the Mains. Before the final qualifying race, the tentative TQs were:

- 4WD Modified: Rob Russell
- 4WD Stock: Bobby Drummond
- 2WD Modified: Jon Anderson



# **TWISTER**

- 2WD Stock: J.D. Beckwith

Sunday opened with a strong showing in all categories as the final qualifying heats were run in the morning. By noon, the TQ in each A-Main had been established:

- 4WD Modified: Eustice Moore Jr.

- 4WD Stock: Bobby Drummond

- 2WD Modified: J.D. Beckwith

- 2WD Stock: Jon Anderson

The A-Mains kicked off with the 2WD



*Jon Anderson, the newest member of the Twister racing team, won the 2WD Stock A-Main with his Associated RC10.*

Stock race, in which Jon Anderson drove an Associated RC10 with a Twister stock motor and turned in a winning performance of 14 laps in 4:08.40. This race was

notable because of Jon's controlled smoothness through each turn and nearly perfect timing off each jump, especially the triples.

The opening seconds of the 4WD Stock A-Main found Bobby Drummond leading the pack with Neil Rabara a close 2nd. Drummond was involved in a crash in turn one, and this disaster allowed Rabara to take the lead. With aggressive driving, Drummond was able to sprint past Rabara as they exited from turn seven and entered the straightaway. He hung on to drive his Schuma-



cher XLS Cat to victory.

Jay Kanemoto took the lead early in the 4WD Modified A-Main. Displaying great determination, he held off challenges by Rob Russell and J.D. Beckwith and brought his Schumacher XLS Cat with a Twister Modified across the finish line



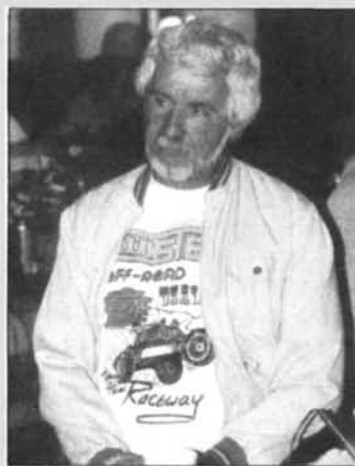
with a winning total of 14 laps in 4:06.20.

Most expected the 2WD Modified A-Main to be the highlight of the Challenge, because many of the best drivers entered. J.D. Beckwith, Jon Anderson, Jay Kanemoto, Eustice Moore Jr. and Bobby Drummond had already shown their abilities in previous heats, and they went on to provide the spectators with the best race of the meet.

Following the starting buzzer, Eustice Moore Jr. quickly took the lead, and he held it for two laps until Jon Anderson wrested it away on turn one and built a comfortable margin of almost 4 seconds. Driving hard and very consistently, Anderson maintained a strong lead until he crashed on turn seven and gave Moore the chance to catch up and run almost alongside.

As they approached turn three, Moore took the inside line away from Anderson,

*(Continued on page 126)*



*Mike Walker, founder of Twister Motors Inc., and the sponsor of the Twister Off-Road Challenge.*

## **Mike Walker Keeps On Racing**

**I**F EDUCATIONAL DEGREES were awarded for racing experience, Mike Walker, founder of Twister Motors, would have a Ph.D. with honors. With over 25 years experience in full-size motor racing (top fuel, drag and stock) in every capacity (driver, designer, engineer and mechanic), he's a relative newcomer to the R/C industry.

Three and a half years ago, in an attempt to provide a creative and competitive outlet, he formed Twister Motors Inc. Mike was looking for an alternative to the heavy demands of the professional racing circuit, but he still

wanted to do something that would utilize his racing experience and expertise. In earlier days, he had raced gas-powered cars as a hobby, but with the advent of R/C technology, he saw an opportunity to continue racing, but with a slightly different slant.

The rapid growth of Twister Motors has created a "Catch 22" situation for Mike. He's now busy touring nationally with his Twister Racing Team, sponsoring races and promoting the sport in general. With this demanding schedule, he still spends more time away from home and family than he'd like. But it's a sacrifice that Mike is willing to make, because he's doing something that's still in his blood after 25 years—racing. ■



## NEXT MONTH: NO FENDERS ALLOWED!

**O**UR NEXT ISSUE will be called the "Open-Wheel Special." It should be exciting, because in open-wheel on-road and off-road classes, the possibility of tangled wheels and sudden shunts always exists. Just ask Little Al!

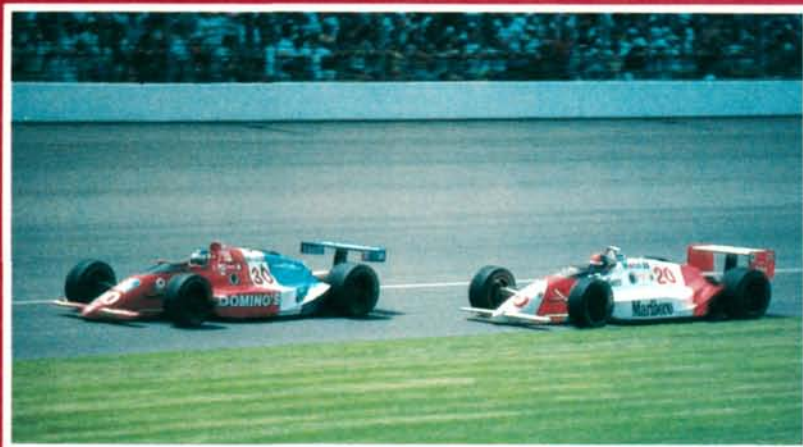


# O

# OPEN-WHEEL

# SPECIAL

by STEVE POND



While I think few prefer open-wheel cars to full-body cars, the full-scale open-wheel ranks include some of the fastest, most powerful racers in the world. European Formula 1 car racing is the most popular type of racing on that continent, and here in the U.S. we have our own version called the Indy cars. With attendance at this one-day sporting event topping the 500,000 mark,

the Indy 500 highlights the popularity of open-wheel racing. Outlaw sprinters and supermodifieds running short tracks bring open-wheel racing to fans across the country.

In this special issue, we'll cover the *seventy-third* Indy 500, and we'll also bring you a feature on the Race Tech 1/4-scale Indy car and let you take a quick peek at the RACO prototype Indy car, which is due to hit the hobby-shop shelves in October.

New Era's East Coast Supermodified will also be reviewed in full, and we'll look at RCRC's RC10 Supermodified conversion.

Since single-seater off-landers can also be classified as open-wheelers,

*Above: RCRC's 1/16-scale Supermodified RC10 conversion will be one of the features in the Open Wheel Special.*

*Left: A shot from this year's Indy coverage, also in next month's special issue. Car No. 20, on the right, is this year's winner, Emerson Fittipaldi.*

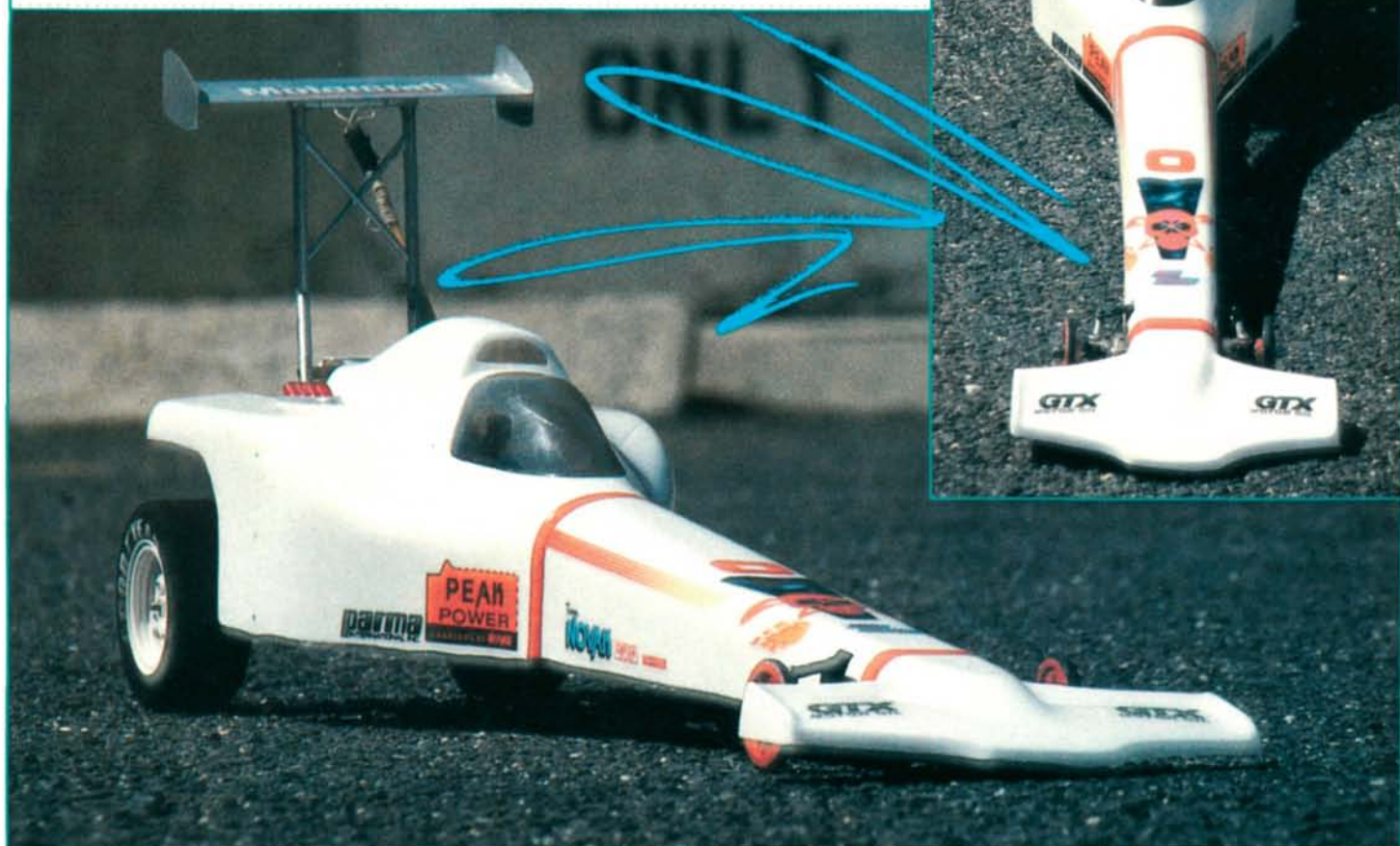
we'll review the hot, new, Schumacher Top Cat, too. (The Top Cat is the 2WD counterpart of the 4WD World Champion.) Be sure to watch for all this excitement in October's *Radio Control Car Action!* ■



SCRATCH-BUILT

# RAIL

3.5 SECONDS OF FUN FOR 3 BILLS

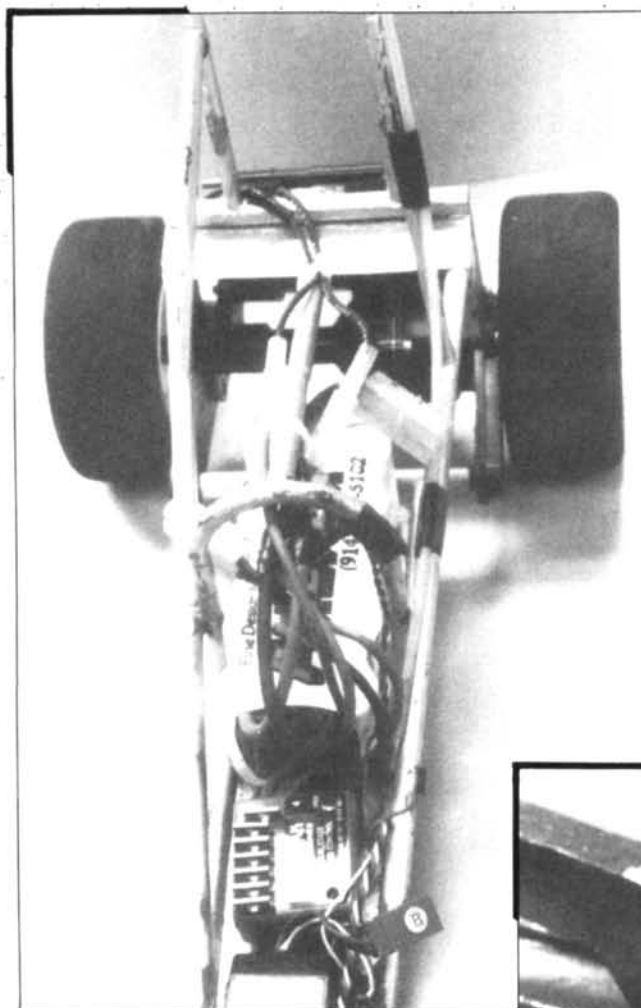


S

TRAIGHT-LINE SPEED has long been a goal of the more mythical names of American racing. Prudhomme, Garlitts, Jenkins and Superman were my boyhood heroes (hey! Superman was faster than a speeding bullet!), and it was the magic elapsed-time numbers from our GTXs, GTOs and Camaros, after all, that measured our progress into manhood in the late '60s. (I had a New Yorker, but it was unlike any other New Yorker Chrysler had ever built.) Speed was *the thing*!

Of course, there was a monstrous attraction to the alcohol-burning funny cars and the nitro-burning dragsters that lit up the sky with raw fuel igniting into stark yellow-blue flames at their header tips. Unfortunately, few of us had the cash to set alight those evening fires.

by BILL O'BRIEN



*Above: The framework is brazed brass tubing. A Marui CJ-7 rear end was used, but you could try others. Right: Front end uses Frog steering arms.*

But with full-scale dragsters out of the financial (and physical) reach of most of us, we naturally carried our R/C mania from dirt tracks to paved tracks to screaming scale  $\frac{1}{4}$  miles. That was one of the reasons I built my rail.

The other reason? I was depressed. I'd spent a whole day at the WRAM show, gawking at the spectacle (and price!) of the  $\frac{1}{4}$ -scale dragsters, and I knew that I had nowhere to run one, even if I had a place to park it. Down in  $\frac{1}{10}$ -scale, which was closer to my budget, it was obvious that by the time I'd bought a decent motor, a speed controller and radio gear, I'd have a much better understanding why drivers of full-scale racing cars need sponsors. It was a sad day in Mudville until I recognized the familiar scent of burning wood that showed I was forming an idea.

Bruckner Hobby is almost directly in the

## SCRATCH-BUILT FUEL RAIL

Type ..... Top Fuel Rail

### DIMENSIONS:

Overall Length ..... 26 inches  
Weight ..... 3.2 pounds  
Height ..... 11 inches  
Wheelbase ..... 24 inches  
Track (front & rear) ..... 4.83 inches

### DRIVE TRAIN:

Gear-Train Differential ..... Marui CJ-7

### SUSPENSION

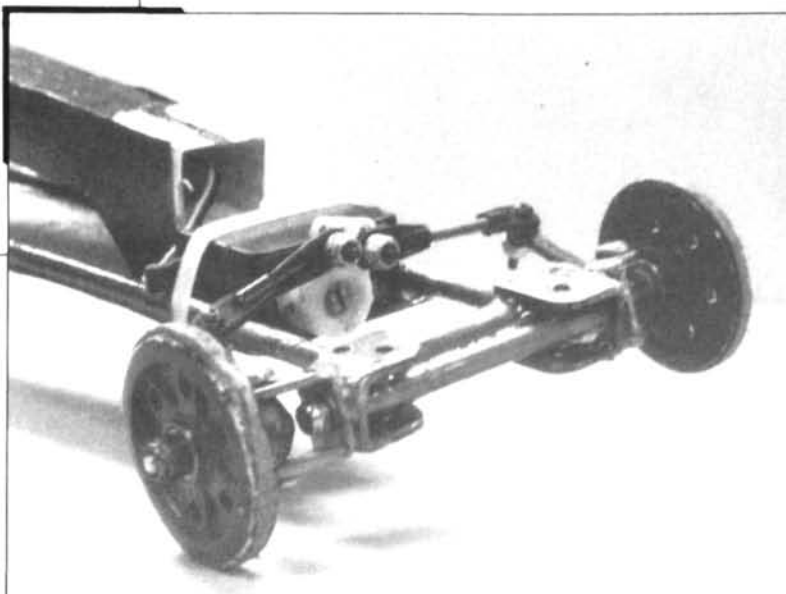
..... None

### COMMENTS:

...In short: A scratch-built dragster can be a lot of fun at less than half the cost of a commercial kit. It's important to remember that bearings should be installed at all points, and, despite the extra effort, all tires should be trued on their wheels. The maximum wheelbase currently supported by rail-body manufacturers is 24 inches. If you build your rail longer than that, you'll need to make a scratch-build body as well. Watch out for short antennas!

path of a squiggly line drawn from Westchester to my home at the tip of Manhattan, so it was natural for me to stop by. Off in the corner, where the older customers pick out prime logs of balsa wood and good advice, there's a cache of brass tubing. Twenty-five dollars later, I jingled out the door to the accompaniment of questions about plumbing repairs.

Back home, I called on all my resources (some videotapes of NHRA and IHRA competitions) and doodled a few rough sketches of full-blown roll cages. After an hour

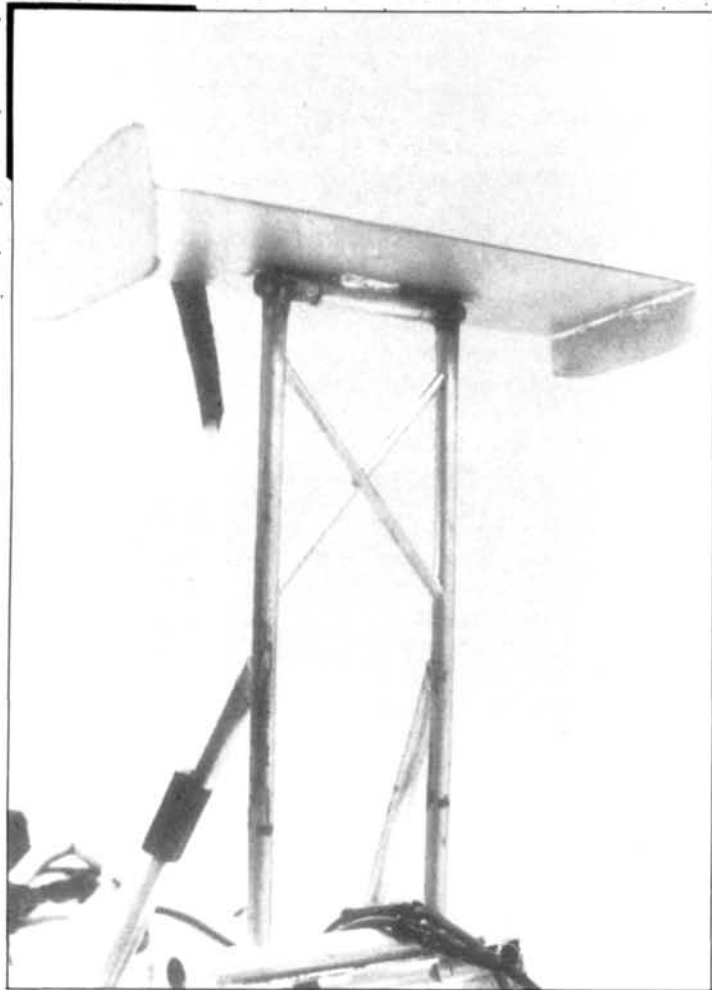


or two, I put a match to my propane torch and started work.

**CONSTRUCTION:** I started large. The new NHRA rules allow a 300-inch wheelbase, so my  $\frac{1}{10}$ -scale rail would have a 30-inch wheelbase. About five hours later, after filing, sawing, grinding and welding, I had a small-scale duplicate of a typical chassis, complete with wing tower.

It hadn't been easy: I had never welded before. One of the first problems was finding a method of joining the shorter, 12-inch brass tubes to make them into the longer pieces that a 27-inch chassis required. My solution? I created a slip joint of sorts: a short segment of a small-dia-





The brass-sheet wing is adjustable. It would be simpler to use a Lexan wing like the good-size one that comes with the Kyosho Burns.

ter tube inside the two lengths to be joined. It worked! Cross-braces were added by filing slots in the large-diameter tubes to accept the thinner bracing.

The chassis looked great, but with all its fine bracing and double-tube construction, it weighed nearly 2 pounds—and that was without the differential, axles, wheels, or tires. Too much brass!

A new design made the chassis much more fragile. Basically, I kept intact some of the rear roll bar and cage, but I used only two parallel lengths of tube from the cockpit down to a single crossbar at the far front end. (While the exact spacing between these side rails can be almost anything, you should make sure that there's enough room between the rails for a servo.) The weight was then only 1.4 pounds—not the greatest, but better by 1/2 pound.

The front end was next on the drawing board. I had a leftover set of Frog steering arms, so I ran a threaded 4-40 rod through a 3/16-inch-diameter brass tube, locked the arms into place with Nyloc nuts on each end of the rod, and then bolted the spindles on. With this method, you can make the front track as wide or as narrow as you want, but I found that with the Frog parts, any track width under 4.5 inches resulted in an unacceptably small gap between the steering arms and an impossible angle for the steering rods. The axle tube was then welded to the front cross-brace.

I used a Marui CJ-7 differential for motive gears (it was handy),

## No Tricky, Sticky or Clinky, Linky Parts!

*Our*

Voltimea is for Ultima or Turbo Ultimas, enabling you to put your 7.2 or 8.4 battery packs lengthwise, completely inside the chassis. Your Ultima will jump, steer and look better plus less rollovers! ..... \$39.00

The Voltimea KV is for the most serious racers and also will fit the new Ultima Pro. It has the same features as our Voltimea stock plus a graphite chassis w/trailing A Arm suspension. Both kits are designed for easy maintenance and durability. No tricky sticky linky parts to break!

Most important of all it works. Quicker acceleration off the line and out of corners and less air time through the jumps. Its high performance for a low price! ..... \$99.00

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## SCRATCHBUILT RAIL

and my exact mounting arrangement will only apply if you use the same diff case. With hindsight, I recommend a Rock-Buster\* rear end, because you can buy a complete set of replacement gears for less than \$5. To reduce friction, bearings are, of course, necessities.

The rear wing was cut out of flat brass stock and mounted on a tube. A larger-diameter piece of tube was used to cap each end of the wing tube, and these segments were welded to the wing tower. If you use this method, you can adjust the attack angle of the wing, or even put it on a servo for remote adjustment. If you want a simpler setup, you can use the rear wing from a Kyosho\* Burns.

**FINISHING TOUCHES:** Up front, I used a small section of brass plate as a base for the steering servo; I welded another, longer plate into the cockpit area for the battery and radio gear. All other exposed sections along the bottom of the chassis were covered with overlapping pieces of index cards. (Paper doesn't weigh very much, and it didn't have to brace or support anything.)

Then I had my first major disappointment: Although a 30-inch wheelbase was still correct in scale, I couldn't find a body that would accommodate that length. At best, 24 inches was the longest I could find, and that was based on the old full-size limits.

Out came the saw and off came 6 inches, and this gave me a 24-inch wheelbase. Then I fitted and painted a Parma\* drag body. The wheelbase still looks as though it's about 1 inch too long for the body, but what the heck! Mounting the body on a fuel rail made of round tubing was an experience I'd prefer to forget! I eventually made a raised platform (index cards again!) to support the front of the body, while a brace on the wing tower held up the rear.

The front wheels had to fit Frog spindles, but I really didn't want to put anything large on them. I thought I was out of luck until I found a pair of IMEX\* 1.5-inch front wheels for Tamiya products. Their diameter was small enough, but they were still too wide. A couple of careful passes with a fine-toothed X-Acto removed both sides of the wheel (the original bead area and overhanging sections to the right and left of the hub). After a little sanding, I had some reasonable-looking, very skinny, drag-racing wheels. Sink washers were used for front tires.

Cushioning the rear end and gripping the ground are Bru-Line\* Super System modular wheels capped with Twinn-K\* foam tires. Because of the limited length of the CJ-7 rear axles, a small central section of each wheel's hub had to be ground away so that the wheel nuts would seat properly.

Perhaps worst of all, I didn't bother to true the front or rear tires to the wheels. I'm running the rail for fun, not competition, and this means I traded some road bounce caused by the untrued wheels on a suspensionless car for about half an hour less labor. If you want to compete, true the tires, and your rail will then have a better chance of staying on the ground.

I went with 10 three-quarter-size sub-C cells (they weigh about the same as a 7-cell pack, but give 3.5 more volts, even though they're only rated at 900mAh), a Futaba\* mini receiver, a Futaba 132 servo, a Race Prep\* 15-turn motor (rated at 45,000rpm with 6 cells) and a Novak\* TempFET speed controller. With everything aboard, it weighed 3.2 pounds, and its center of gravity fell 4 inches in front of the rear wheels.

**PERFORMANCE:** The track of opportunity was a 145-foot stretch of fresh blacktop. That's a bit tight for a 132-foot scale 1/4 mile, but with braking and turning, I was confident that I'd show my prowess. Boy, was I wrong!

The first run proved that a short antenna was only good for a short distance. Tucked mostly inside the body with just a wee bit sticking out under the wing, the antenna became deaf and dumb about 100 feet down the track. It left me with no brakes, no steering and no control. I watched as my rail completed its run into a concrete retaining barrier, stood straight up on its front wheels, and then fell back to earth with all the grace of a giant sequoia toppling in the forest. Right across the middle of the front end was a hump that would have made a camel proud. The only thing to do in a situation like that is shake your head, pick up all the pieces you can find and make a strategic withdrawal.

Three hours later, I was back with an epoxied front end that was better than new and a slightly rippled, but, nonetheless, mostly straight chassis. Needless to say, the antenna now stood out about 9 inches into the wind.

What can I say? It was worth the time spent on it. When I hit the throttle, the engine unwound and the rail took off.



Even running a 20-tooth pinion, which is about four teeth too many, I managed the 132 feet in 3.5 seconds. If you consider that pure competition rails will run a 2.3- to 2.5-second scale 1/4 mile, that doesn't sound like much, but it's certainly gratifying when you're in it for fun, and my total cash outlay was less than \$300 (primarily for the electronics, which can be transplanted into future cars).

**WHAT'S NEXT?:** If I wanted to get really serious about this thing and still use a scratch-built chassis, I'd probably switch over to an Agitator front end and a commercially available, on-road differential (quite a few companies market on-road differential cases and gears). There's even the possibility of a flat graphite chassis, but at that point, you start adding hefty dollar amounts, and it might be just as easy to buy a professional rail kit with a pre-shaped and drilled carbon chassis and other exotic goodies.

You'll never spend as much as you'd have to for a full-size rail, but your bank account will be depleted to the tune of \$700 by the time you're through with everything you'll need (including electronics) for a commercial kit.

No matter which way you go, you can expect your rail to run more slowly on uneven surfaces where traction is poor—or fair, at best—like the track I used, which was reasonably flat, but had a slightly pebbled surface. In a high-traction environment, however, it will run faster than a speeding bullet. Of course, if a few friends just get together in a parking lot, no matter how fast or slow anyone's rail is, a good time will be had by all. Bragging rights will go to whomever has batteries that last more than 20 seconds!

*\*Here are the addresses of the companies mentioned in this article:*

**RockBuster;** distributed by World Engines, 8960 Rossash Ave., Cincinnati, OH 45236.

**Kyosho;** distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

**Parma International Inc.,** 13927 Progress Pkwy., North Royalton, OH 44133.

**IMEX Model Co.,** 53 Trade Zone Court, Ronkonkoma, NY 11779.

**Bru-Line,** P.O. Box 3786, Center Line, MI 48015.

**Twinn-K,** P.O. Box 31228, Indianapolis, IN 46231.

**Futaba,** 4 Studebaker, Irvine, CA 92718.

**Race Prep,** 20115 Nordhoff St., Chatsworth, CA 91311.

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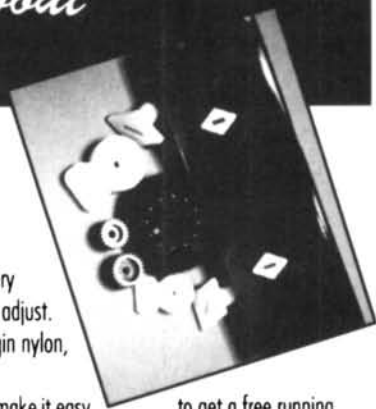
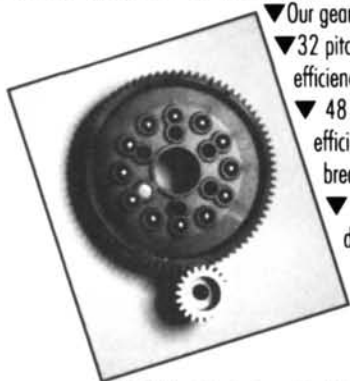
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F & D ' S

# ULTIMA CHAIN DRIVE

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**A**LTHOUGH A VARIETY of belt drives and chain drives has been available for the RC10 for some time, trick drive systems for the Kyosho\* Ultima haven't been all that plentiful, because after-market manufacturers want to be sure that a car is a viable racer before they tool up to make parts. At last, however, these manufacturers have realized that the Ultima is just such a car, and Team F&D Racing Products\* has produced a chain-drive diff for it.

This project started as review of the F&D chain drive, but it rapidly turned into an all-out project to ready my race-weary Turbo Ultima for the upcoming season. My goal was to reduce its weight to 3 pounds, 3 ounces and to make it a potential A-Main winner in the 2WD Modified Class. I added several trick parts, including a Trinity\* graphite chassis, a Futaba\* FP-S135S servo, Rocket City\* ball links, a Tekin\* micro receiver and a Twister\* modified motor.

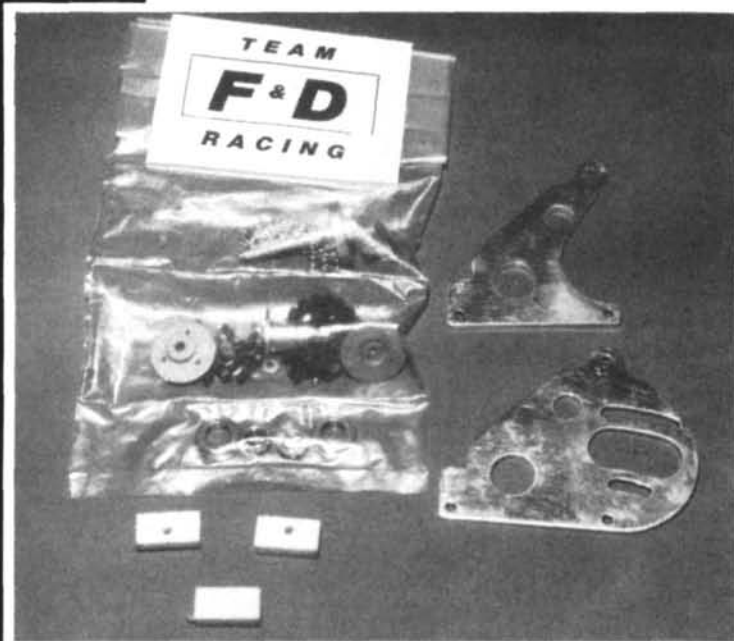
Why would anyone spend money on replacing a rear drive unit that seems to work fairly well? Simple: To obtain a *more efficient* setup. The stock Turbo Ultima gearbox has a few problem areas:

- It has three gear interfaces.
- The cover presses against the transfer gear, and this causes drag.
- The grease used on the gears is usually thick, and this also causes drag.

The F&D chain drive attacks all three areas. First, it has one gear interface and one chain, so you get rid of one gear interface and the two ball bearings that support the gear shaft. The unit is open-faced and has no covers to cause drag, and, because of its open architecture, it requires dry lubricants that don't attract dirt. These dry lubricants aren't sticky, so they don't cause drag, as thicker greases do.

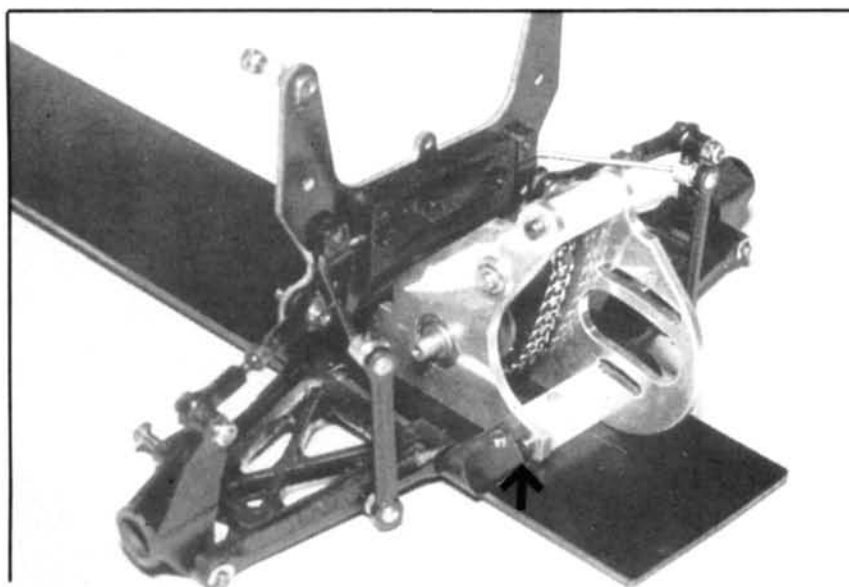
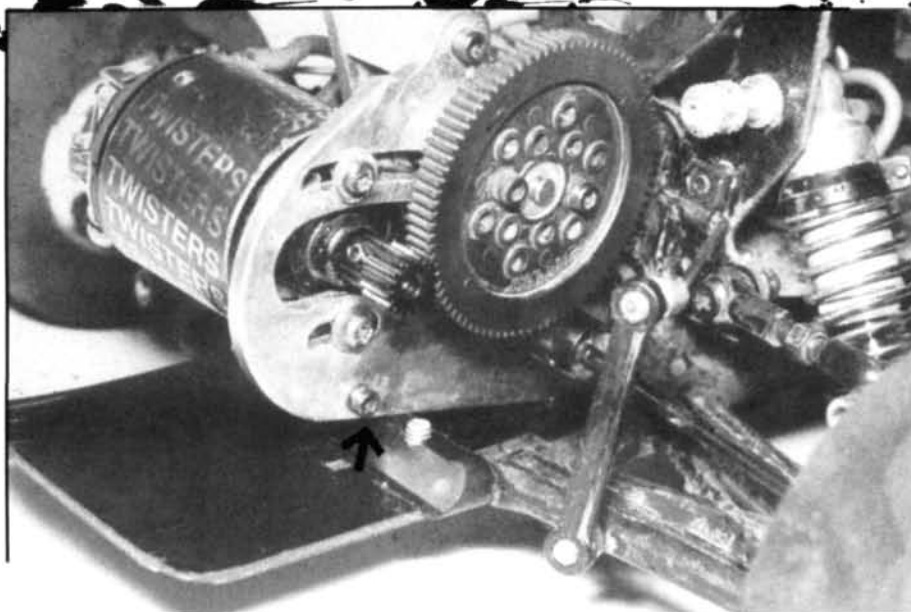
**THE KIT:** When I removed the F&D chain drive from its shipping box, I saw a well-packaged collection of small parts stored in four compartments. (The first contained the chain-drive unit; the second, the ball-diff unit; the third, four ball bearings; and the fourth, the two side plates, three mounting blocks and the instruction sheets.)

by JOHN RIST



*Good packaging is most welcome, considering the many small parts.*





*Above: The first attempt at installing unit shows less-than-optimum results. If done correctly, it isn't necessary to cut the center section out of the rear axle support.*

*Top photo: When installed properly, the F&D chain drive rests on top of the rear axle support. The extended rear end of the Trinity chassis absorbed the impact of a brutal crash without missing a lap.*

My first *complaint* is that the ball diff comes completely unassembled. (Have you ever counted the number of parts in a ball diff?) Before you open the package, I recommend that you find a tray in which to store the parts and to work over when you assemble the unit. The ball diff supplied with this chain drive is a standard Thorp\* unit, so spare parts should be readily available.

**CONSTRUCTION:** A ball diff is usually assembled as it lies on its side, so I stuck part FD-9 in a small block of Styrofoam. Next, I greased both diff plates (FD-7 and FD-9) and the ball-carrying plate

(FD-8) with a silicone lube. The six  $\frac{1}{8}$ -inch steel balls are snapped into the six holes in the ball-carrying plate (FD-8). The three plates are stacked in the order shown on the instruction sheet and then fastened together with the long Allen cap screw, four washers, two ball-carrying washers and eight  $\frac{1}{16}$ -inch steel balls. The correct stacking order for these parts is shown on the instruction sheet, but I'll give you some hints to help in this step. If you look closely at the ball-carrying washers (FD-6) you'll notice that they're "dished" on one side only. The  $\frac{1}{16}$ -inch steel balls ride in these "dishes," and you should ensure that the dished side of both washers faces the balls.

The next trick is to get the balls to stay in place while you insert the Allen cap screw and washers. First, coat one of the FD-6 washers with diff lube and put it in place. (A small jewelers' screwdriver helps to push the washer to the bottom of the hole.) Next, coat the steel diff balls with diff lube, put them into the holes one at a time and maneuver them into place with the jewelers' screwdriver. The diff-lube coating acts as glue and holds the balls in place long enough for you to position the Allen cap screw and the remaining washers. Do *not* over-tighten this screw, or you might damage the ball diff. The tightness of the ball diff is controlled by this screw, and the final setting should be made *after* you have the car running. It's better to readjust the ball diff later than to damage it initially, so start out with it snug but not tight. Finally, bolt the cover plate (FD-3) into place with three Allen cap screws.

Next comes the final assembly of the chain-drive unit. The two side plates are held together with three nylon blocks and six Allen cap screws. By carefully comparing the exploded view on page 1 and the top view on page 2 of the instructions, it's possible to get all the parts in the right place. Pay close attention to the location of the flanges on the four flanged ball bearings: The smaller (9mm) bearings have their flanges to the outside; the larger (14mm) ball-diff support bearings have their flanges to the inside.

Also note the positions of the three nylon blocks that support the two aluminum side plates. The top block has only two holes—one in each end. The bottom

two blocks have two end holes and a third hole through which the chain drive is mounted on the car. Be aware that one of the bottom blocks has a beveled edge: This is the bottom front block, and the bevel goes toward the ball diff to clear the chain.

First, bolt the three blocks to the motor-mounting side plate. (Don't over-tighten the Allen bolts: It's easy to strip out the nylon blocks.) Install the four ball bearings and insert the spur-gear shaft and the ball diff into the side plate that has the nylon blocks attached. Now install the chain and the chain-drive gear, making sure that the links of the chain face in the right direction. The note in the instruction sheet that shows the direction of the chain travel is a little confusing, because it doesn't say whether the picture is of the top or the bottom section of chain. (F&D told me that it's the top section of chain, so the open end of the links on the top part of the chain point toward the front of the car.) The last step is the installation of the remaining side plate.

**INSTALLATION:** Finally, it was time to install the chain-drive unit in my car. My first attempt at this worked fairly well, but it certainly wasn't perfect. For the life of me, I couldn't figure out how to cut the rear axle support, and the instruction sheet doesn't provide a view of the chain drive installed in the car.

I assumed that the chain drive should be mounted flat on the chassis (in the same way as the stock differential assembly was mounted), and the only way to do this is by cutting out the center section of the rear axle support. This made the support very wobbly, because each half was supported by only one screw. I managed to get this arrangement to work by putting a drop of instant glue under each side. A phone call to F&D revealed that the chain drive does *not* lie flat; instead, it sits on top of the rear axle support.

To install the chain drive, I recommend that you first remove the rear axle support, and then, using the template supplied with the plans, locate and drill the two mounting holes in the bottom plate.

Next, re-install the rear axle support, which will cover the rear mounting holes that you just drilled. From the bottom of the chassis, drill the rear mounting hole through the axle support. You can now

use one short and one long 8-32 screw to mount the chain drive. I used Associated\* aluminum 8-32 screws: a 1/2-inch screw in front and a 7/8-inch screw at the back. Once again, be careful not to over-tighten these screws, because the nylon is easy to strip. The addition of outriggers, a spur gear and a *hot* Twister motor finished the package.

**PERFORMANCE:** I run on two types of tracks: a fairly long, banked, dirt oval and a short, indoor, carpet oval. The dirt track requires very high gearing for high speeds; the carpet track needs low gearing for instant acceleration. The F&D chain drive has an 8-tooth sprocket and an 18-tooth sprocket for a ratio of 2.25:1.

tima was a brutal trophy run at RC Hobbies' dirt oval in Huntsville, AL. My 18-year-old son Joe easily made the A-Main in the 2WD Modified Class, and we managed to come in a close 2nd in the A-Main. I don't think the car that beat ours was any faster; it was just hooked up better in the curves. This is understandable for the first race of the season with a totally new, untested car, but wait till next month's race!

To sum up, I'll tell you my likes and dislikes about F&D's chain drive. First the dislikes: Number one, of course, is the instruction sheet. There are almost no words, just pictures. Maybe a picture is worth a thousand words?! The only hint



*The tools, diff lube, instruction sheet and finished chain are resting in the tray used to prevent the loss of small parts.*

I installed a Team Losi\* 48-pitch, 86-tooth spur gear. The chain drive uses an RC10-style spur gear. I have a set of motor pinion gears that range from 16 to 26 teeth. These provide me with gear ratios that range from a low gear of 12.1:1 to a high gear of 7.44:1. F&D also told me that it can supply a 7-tooth chain-drive gear that will give a 2.57:1 internal gear ratio. I suspect that this would turn the car into a rocket ship on a short indoor track where low gearing is necessary. With the full range of RC10-style gears, you should be able to dial-in the desired run time on most any track.

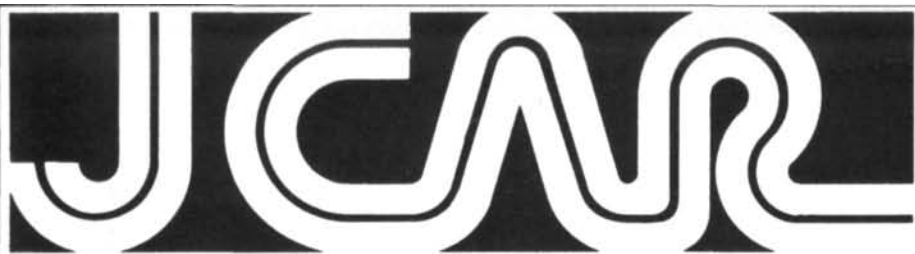
The proof of any hot setup is its performance on the racetrack. Our first race of the summer with the chain-driven Ul-

of any installation instructions is the template with which to drill the mounting holes. As I described earlier, my first attempt at installing the unit resulted in a less-than-optimum setup.

My next complaint is about the openness of the ball diff. If you're running in dirty conditions, you'll have to clean the ball diff frequently, but you shouldn't have any problems on carpet or on-road tracks.

And the final potential problem I see with this unit rests on the fact that it doesn't bolt to the rear shock tower. This is a good-news/bad-news situation: The good news is that the unit is lighter than the stock gearbox; the bad news is that the





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## ULTIMA CHAIN

original Ultima's chassis is very thin and soft. The stock transmission bolts to the chassis and to the shock tower. This forms a triangle that supports the tail end of the chassis plate. As long as you're running a graphite chassis plate or the heavier Turbo Ultima chassis, it should be no problem, but a violent crash might bend the stock Ultima chassis.

Now for my likes: First and foremost, this chain drive is very efficient and fast. The first time I spun the rear wheels without a motor installed, I was impressed with their long coast-down time. I also like the absence of any kind of a chain tensor, which would prevent the chain from rubbing against the motor while you're braking, but it would add weight, complexity and drag, all of which a serious R/C car racer can do without! In fact, with the exception of the motor-pinion-to-spur-gear spacing, no adjustments of any kind have to be made. If the chain stretches with use, simply remove a link.

Writing about the chain, I'm reminded of another advantage of this unit. All the parts that might break or wear out are standard and easy to obtain. The ball diff is from Thorp; the chain is a standard Optima 4.8mm chain; the spur gears are from the RC10; and the ball bearings are standard 14mm and 9mm flange bearings. Any well-stocked R/C car shop should have them in stock.

The heavy aluminum side plate provides a good heat sink for the motor, and its large holes allow cooling air to pass through it. There's also plenty of room to install your favorite motor heat sink. The motor-adjustment slots are long and allow the use of motor or pinion gears of any size.

Although this unit might require frequent cleaning on a dirty track, and it's a bit of a pain to install (it doesn't fit the stock holes), it could provide the winning edge when the competition gets hot. And that's what I was looking for in the first place!

*\*Here are the addresses of the companies mentioned in this article:*

**Kyosho**; distributed by Great Planes Model Distributor, P.O. Box 4021, Champaign, IL 61820.

**Team F&D Racing Products**, 4712 Avenue N, Suite 176, Brooklyn, NY 11234.

**Trinity**, 1901 E. Linden Ave. #8, Linden, NJ 07036.

**Futaba**, 4 Studebaker, Irvine, CA 92718.

**Rocket City Specialties**, 103 Wholesale Ave. NE, Huntsville, AL 35811.

**Tekin Electronics**, 970 Calle Negocio, San Clemente, CA 92672.

**Twister Motors**, 657 E. Arrow Hwy., Suite H, Glendora, CA 91740.

**Thorp Mfg.**, 380 S. East End, Unit H, Pomona, CA 91766.

**Associated Electrics**, 3585 Cadillac Ave., Costa Mesa, CA 92626.

**Team Losi**, 1655 E. Mission Blvd., Pomona, CA 91766.

## TRACK REPORT



C O X

# ULTRASTOCK

by DICK BRINTON

## STADIUM RACING ON A BUDGET

**C**OX\* CALLS its Ultrastock a "1/10-scale, off-road grand-prix racer." "Grand Prix" refers to Mickey Thompson's Off-Road Championship Grand Prix races, particularly to the fact that the body of the Ultrastock is modeled after that of the Toy-

ota Supra, which competes in that series.

The Ultrastock has some nice touches: The wheels are modeled after Center Line's beautiful full-scale racing wheels, and the Supra body looks good. In fact, just sitting still, the Ultrastock seems to be ready for anything. Unfortunately, the truth lies *under* the glitter!

### Ultra What?

The prefix "ultra" means "extreme; drastic; outstanding"—even "radical"! The Ultrastock is strange; had Cox done just a *little* more, it would have produced a really nice car. The car's basic design is fine: Trailing arms are at the rear and par-

allel A-arms are at the front. There's a rearward weight bias to help traction, and a good, flexible bumper to protect the front end when the car smacks into something—and it will. Why?—because somehow in the manufacturing process, handling was overlooked. For example, the molded nylon suspension parts are tough, but they don't work well. Even after more than the recommended break-in, the "live, maintenance-free" hinges are far too tight. In fact, the front springs and friction shocks can be left off the car with very little effect on handling!

The nylon cups that grip the spindle-carrier pivot balls hold the balls so tightly that the steering is impaired. I could hear the servo straining to make the wheels turn, and there was no such thing as a quick response. You have to wait while the servo works against the excessive friction in the system, and this is unacceptable on a car where quick steering response should be





part of the package.

The design works much better at the rear. Since there's only one hinge (the front suspension has two), there's less resistance, and the rear trailing arms work quite well. Of course, the shocks are the so-called "friction" type, and this means they exist only for appearance and to support the springs, since any friction that develops in the movement is hardly noticeable.

The instruction manual refers to bearings that can be used in place of the "metal bushings," so the design apparently called for *metal* bushings. Unfortunately, Cox opted for plastic ones, which never last long. I happened to have some metal bushings that fit, so I used them in the right front wheel, and I used the plastic ones in the left front. After running the car for less than an hour, the left front wheel had more than *twice* the play of the right, so metal bushings are obviously necessary.

Since no motor cover was provided, the dirt that kicks off the rear wheels came through the brushes' cooling holes. Motors don't last very long when they take dust and dirt into their innards, and a simple foam motor cover would solve this problem.

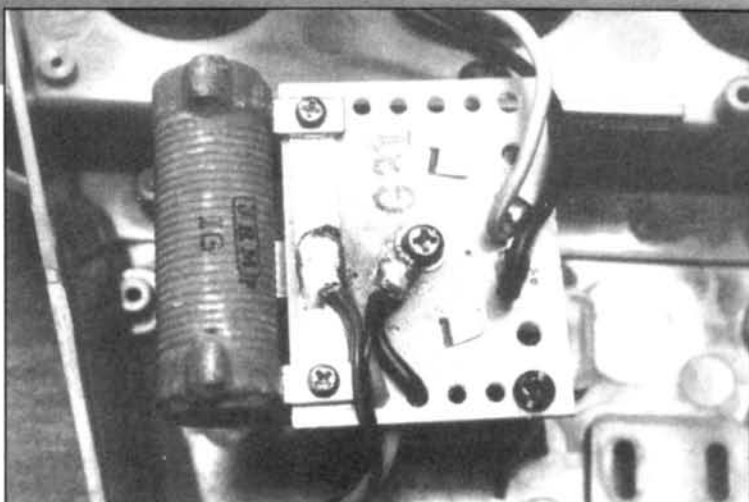
The instruction manual could be improved. If you're using a BEC (Battery Eliminator Circuit) receiver so that you won't have to lug around an extra pack of AA batteries, don't mount the receiver as instructed. Instead, here's an idea from Jim Newman's "Pit Tips": Put some black plastic tape on the bottom of the receiver, and use servo tape to keep it in place (as shown in the photo). By using the black plastic tape, you'll be able to remove the receiver without peeling the servo tape off the plastic receiver case. (Yes, I read every issue of *Car Action* from cover to cover!)

If you have a BEC receiver, the power connectors will have to be soldered to the bottom of the speed controller (with the use of a voltage-dropping diode). Connect the wires that provide the BEC power to the battery leads where they are soldered to the speed controller. Make sure you connect black to black and red to red, or you'll cook your receiver. (In the photo, the speed controller is upside-down. I used the screw just to hold it tightly so that I wouldn't need a third hand to complete the soldering.)

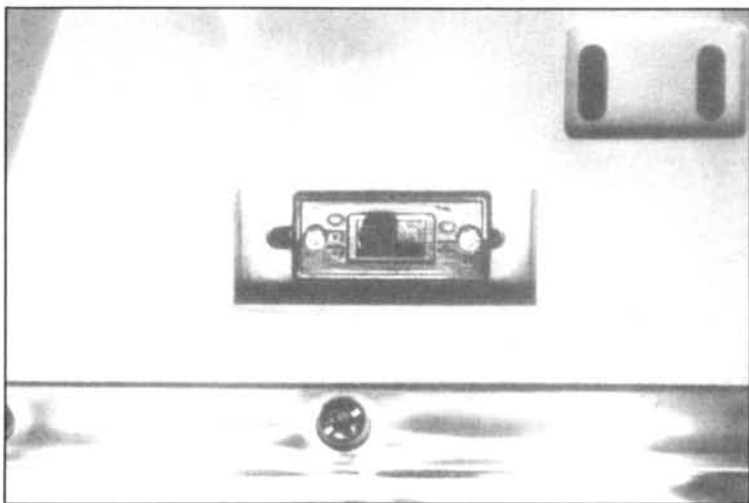
The body's rear-wheel cutouts have to be enlarged to clear the rear wheels. Put the body on the completed chassis and mark the correct outlines with pieces of thin tape. (Make sure the contours are the same on both sides of the car before you enlarge the openings.)

### Ultra Improvements

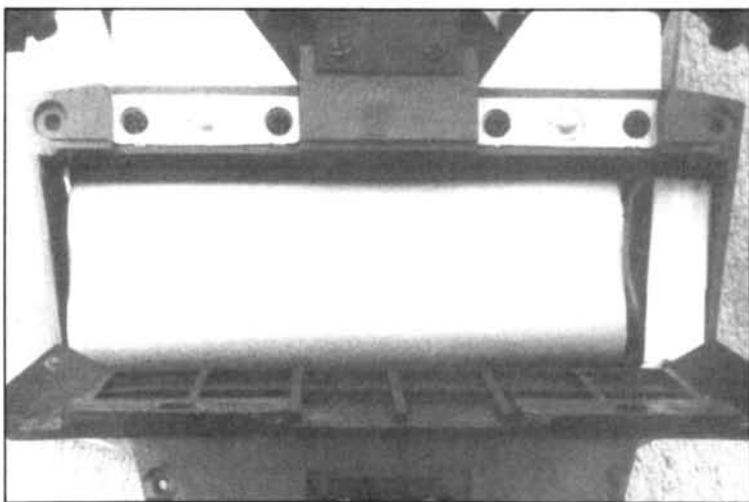
Because I want to provide you with accurate reviews, I usually follow the manufacturers' directions and only try to make improvements when a mistake is



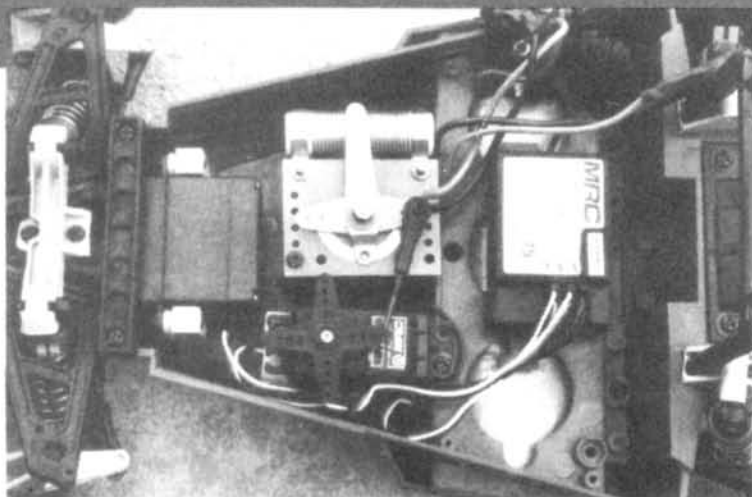
*Bottom view of the speed controller shows the solder connection for a BEC receiver.*



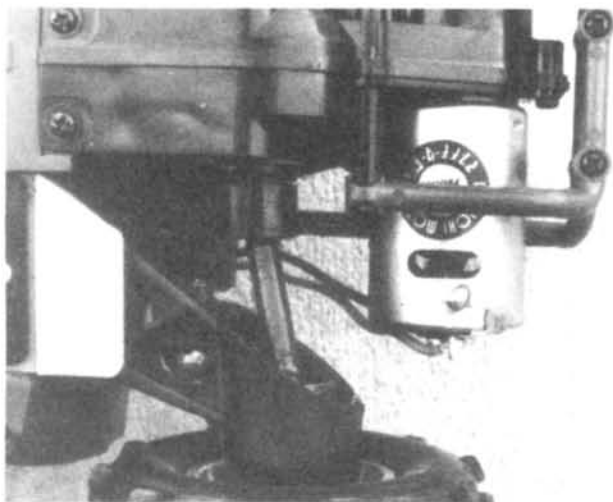
*The on/off switch is on the bottom of the chassis and is subject to much abuse from dirt and stones. Without some sort of cover, it won't last long.*



*Because the battery box is too large, it's suggested that you use the battery connector (on right) as a "jam" to hold it in place. This isn't a good system, since it kinks the wires and they'll eventually fray.*



Top view of radio layout shows the receiver position when BEC receiver is used.



Bottom view of cooling hole in motor shows its close proximity to the rear tire. Without a protective cover, this is a real dust collector.

obvious, but since the Ultrastock looks so "rad" and has a design that's basically sound, I did decide to go further.

First, I tried dry graphite lube on the tight cup-and-ball joints. This didn't work, so I gave them a shot of Teflon lube, but there was still no improvement. Finally, when I "clearanced" them with some liquid rubbing compound, the steering worked as it should have in the first place.

The directions for the front suspension say: "Flex the hinges at least 10 times." I flexed them as far as they'd go at least 50 times, and there was an improvement, but hinge resistance still provided a considerable amount of the "spring"

action. When the front suspension is too stiff when compared with that of the rear, a car will generally understeer. The Ultrastock understeers a lot on concrete, asphalt and hard, packed dirt, but on the soft stuff, its manners improve. If only this car handled as well as it looks!!

Cox, why not make this kit as good as its design will allow? At least, throw out the plastic bushings and provide metal ones; fix the front suspension and, while you're at it, include some oil-filled shocks. With a few improvements, you could see an Ultrastock in every R/C garage in town.

*\*Here's the address of the company featured in this article:*  
Cox Hobbies, Inc., 1525 East Warner Ave., Santa Ana, CA 92705.

**COX**

## ULTRASTOCK

Type ..... 2WD off-road  
Scale ..... 1/10  
Sug. Retail Price ..... \$170

### DIMENSIONS:

Overall Length ..... 17.25 inches  
Width ..... 9.25 inches  
Height ..... 6 inches  
Wheelbase ..... 10.1 inches  
Front Track ..... 7.1 inches  
Rear Track ..... 7.75 inches

### WEIGHT:

Gross (w/bat.) ..... 59 ounces

### BODY:

Type ..... Toyota Supra  
Material ..... Polycarbonate

### CHASSIS:

Type ..... Tub  
Material ..... ABS

### DRIVE TRAIN:

Type ..... Pinion/spur  
Differential ..... Planetary gears  
Bushings ..... Plastic bushing

### SUSPENSION:

Front: Type ..... Live nylon hinge - A-arm  
Dampening ..... Coil-over friction shocks  
Rear: Type ..... Live nylon hinge - Trailing arm  
Dampening ..... Coil-over friction shocks

### WHEELS:

Front: Type ..... One-piece Center Line replica  
Dimensions (DxW) ..... 2x.6 inches  
Rear: Type ..... One-piece Center Line replica  
Dimensions (DxW) ..... 1.5x1.3 inches

### TIRES:

Front ..... Treaded rubber  
Rear ..... Square knobs

### ELECTRICS:

Motor ..... Mabuchi 05  
Battery Req'd ..... 7.2V flat pack  
Speed Controller ..... Wire-wound forward & reverse

### OPTIONS AS TESTED:

MRC Top Gun Radio.

### COMMENTS:

The Ultrastock should have been a good kit, but because of plastic bushings, a poorly designed front pivot and hinge system and a lack of quality shocks, it missed the boat. This car could be improved with ball bearings, but it won't be a competitive 2WD off-road contender. For backyard stadium racing, it could be fun for the first-time buyer.





Associated's Cliff Lett even had spectators watching his every move in the pits!



Ken Caniff captured 2nd place in Concours with this Heartbeat of America paint job.



Dennis Dorrity's IG Outlaw Wedge took 1st place in Concours with its scale fuel cell housed in a hand-built cage. Nice touch!







place in Concours went to Bill Henning's hand-  
ed California Raisins car.



All cars were carefully teched; nobody would  
have an unfair advantage.

# ROAR DIRT OVAL NATIONALS

## FIVE NATIONAL CHAMPS NAMED IN NORTH CAROLINA

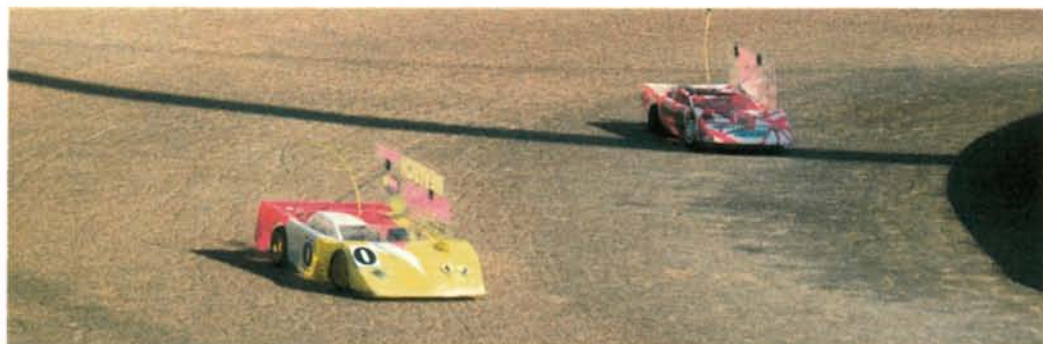
by WALLY DAVID

**A**S THE CURTAIN rose on the second annual ROAR Dirt Oval Nationals, the weather forecast for most of the East Coast predicted rain for the entire weekend. Pessimists thought that an alternative event would have to be held—the ROAR Boat Oval Nationals—because the track might be navigable only by boats!

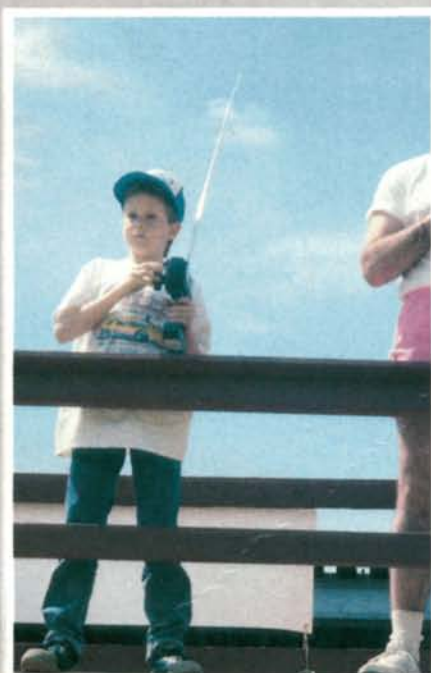
With this forecast in mind, Dave and Margaret Guerin (owners of the R/C Hobby Workshop & Raceway in Burlington, NC) rearranged the race schedule in an attempt to run as many races as possible before the start of the deluge. The original plan was to run one heat on Friday, two on Saturday and Concours and the Mains on Sunday. At the end of Thursday's cold, cloudy practice sessions, they decided to run two qualifying heats on Friday, Concours and one heat on Saturday and the Mains on







## A FACTORY RIDE FOR A NINE-YEAR-OLD!



Shawn Hamby was all business on the drivers' stand.

**W**HEN YOU ATTEND a race at national level, you always expect to see the big-name drivers in the top Mains in each class. You also expect at least one local or unknown driver to crack the A-Main; but no one expected the success of nine-year-old Shawn Hamby, of Graham, NC. With the support of his family and guidance and mechanical help from his father, Earl, Shawn really made an impact at the Nationals. Even though competing against names like Brian Landgraff and Chris Doseck, along with other very experienced drivers, Shawn qualified 5th in the 4WD Stock A-Main.

With a Rockbuster as his first R/C car,

Shawn started racing at the ripe old age of six. From there, his parade of cars included a Fox, an RC10, an Optima and, finally, a Custom Works Dominator.

At the ROAR Dirt Oval National Championships, he was up against the best in the country. What's his secret? "Don't get nervous, or you can't concentrate, sir." (Every question I asked was answered with a "sir" somewhere along the way.) Shawn told me that before the weekend started, he thought he'd be the last qualifier ("I thought they'd blow my doors away"), but, for him, the key is trying to forget who's driving the other cars on the track.

Shawn definitely *didn't* get his doors blown away—No sir! By finishing 9th, Shawn now ranks as the 9th best driver of the 49 entered in the class (not forgetting all the other people who weren't brave enough to compete at a national race!).

There's even more to this story: Bob Currie of Track Master took a liking to Shawn and realized the extent of his talent, so throughout the weekend, he and the Track Master team helped Shawn with battery information and gear choices. I was talking with Bob after the completion of the Mains when Shawn came up to thank him for all his help. It was during this conversation that Shawn Hamby—all of nine years old—became a driver for Track Master! Shawn will be driving an RC10 with Track Master's Belt Drive Gearbox and Graphite Oval Chassis, and he'll also get help with batteries and motors. I think it will only be a short time before Shawn Hamby's name starts popping up at many of the big races around the country. ■

Sunday. They hoped this arrangement would enable them to complete most of the qualifying early and give the Concours winners the choice of running their winning bodies in their last heat, instead of having to run them in the Mains.

With almost 350 entrants, practice time was quite frustrating, and racers bunched around the frequency board as they waited to get their clips. Then it was off to line up for a place on the drivers' stand. If you had to make changes to your car, you had to give up your clip and your place on the stand, and to avoid this, many drivers understandably made radio and speed-control adjustments in line and on the stand, but this didn't make anyone happy.

If practice runs had been organized according to the order of the heats, time could have been set aside to make changes and dial-in cars to the track. Everyone would have known his scheduled practice times and could have relaxed and enjoyed the times between them. Another option would have been to practice by class and to allow each class one hour's practice. Our hosts, the Guerins, were interested and concerned, so I don't expect any problems the next time they hold a big race.

The 270-foot, clay, tri-oval track is smooth and rock-hard with 15-degree banking, and it only has to be wetted for racing and covered when not in use. Throughout the event, the sur-

face was relatively consistent, but it eventually developed the usual "blue groove" caused by all that rolling rubber being laid down.

Fortunately, the weather held for all three rounds of qualifying. With 34 heats in each round, drivers had plenty of time to wander around the pits and look at other cars, and the factory team drivers were friendly and helpful. Pit access was restricted to registered racers and their crews, and the diligent security people directed people without passes to the spectator areas. There was no need to worry about leaving your pit space and having something disappear!

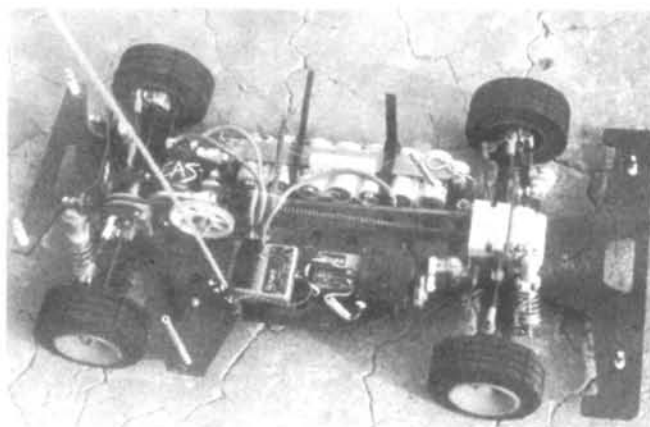
With 30 laps, Randy Bartlett beat 95 entrants to take the 2WD Stock Class Top Qualifier (TQ) honors; he drove an RC10 with a Team Pit Stop chain-drive transmission. Also driving an RC10 with a TPS tranny, Slammin' Sammy Blackwell (his nickname; I *didn't* invent it!)

was 1 second behind Bartlett. Jeff Swartz drove a scratch-built car with a J-Car direct-drive transmission to 3rd, and Terry Troup rounded out the top four with his scratch-built J-Car.

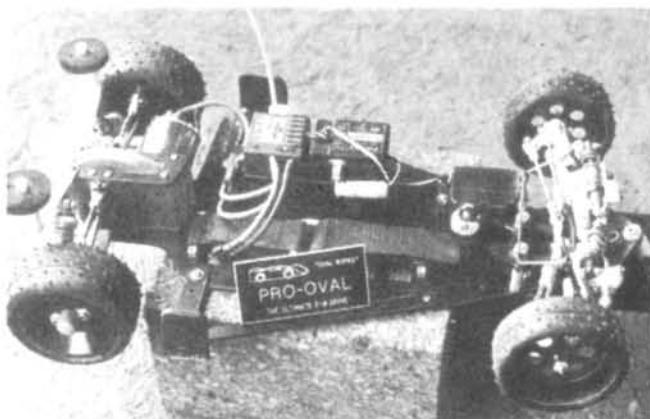
There were 49 entrants in the 4WD Stock Class. The Custom Works Dominator lived up to its name and made up the whole field for the A-Main. Jeff Floyd qualified 1st with 32 laps; Warren Darby turned 31 laps in 4:01.47 for 2nd; and Brian Langdruff came in 3rd with 31 laps in 4:01.76. If that wasn't close enough, Tom Adams qualified 4th with 31 laps in 4:01.87. Whew!!

Race Prep provided stock hand-out motors for both classes, and racers were allowed to buy two more motors and then race the best of the three. (Most took advantage of this option.)

When the dust settled in the Sprint Class, Mike Lemanczyk had piloted a Fantom-powered RC10/Big Boy Toys with a



This is JG's prototype of an oval conversion kit for the Yokomo YZ-10.



Bob Sanford won the "Best Engineering" award with his prototype Pro-Oval car. This 2WD car has one-way bearings on the outside wheel. Bob used Andy's and Associated suspension parts and Delta shocks.

## 2WD STOCK A-MAIN

Fin.	Laps	Name	Q	Car/Tranny	Motor	Speed Control	Front Tires	Rear Tires	Body
1	31	Sammy Blackwell	2	TQ RC10/Team Pit Stop		Novak T-1X	DuraTrax Matrix	Advanced Grand Prix	Custom Works
2	30	Terry Troup	4	Scratch/J-Car	R H	Novak 4	BoLINK Green	Advanced Grand Prix	Andy's
3	30	Jeff Swartz	3	Scratch/J-Car	A A	Tekin 600	Schum. 2-Row Spike	Advanced Grand Prix	Andy's
4	30	David Kiser	10	RC10/Stock	C N	Novak T-1X	Pro-Line 1018	Pro-Line Octigrab	Custom Works
5	29	James Doby	5	RC10/Stock	E D	Novak T-1X	DuraTrax Matrix	Pro-Line Octigrab	Custom Works
6	29	Randy Bartlett	1	RC10/Team Pit Stop	P -	Novak 1-X	DuraTrax Matrix	Pro-Line Octigrab	Custom Works
7	28	Bob Pecker	9	RC10/J-Car	R O	Novak T-1X	Pro-Line Waffle	Pro-Line Octigrab	Custom Works
8	27	Jim McCallum	8	RC10/Stock	E U	PDI Zeta	DuraTrax Matrix	Pro-Line Octigrab	Andy's
9	26	Denvil McCallum	6	RC10/TPS Rework	P T	PDI Zeta	DuraTrax Matrix	Pro-Line Octigrab	Andy's
10	23	Eric Dobbins	7	RC10/J-Car		Novak 1	BoLINK Green	BoLINK Green	Custom Works

## 4WD STOCK A-MAIN

Fin.	Laps	Name	Q	Car	Motor	Speed Control	Front Tires	Rear Tires	Body
1	32	Warren Darby	2	CW Dominator		Novak 1X	Gizmo Foam	Gizmo Foam	Custom Works
2	32	Chris Doseck	7	CW Dominator	R H	Novak T-1X	Losi Med. Foam	Losi Med. Foam	Custom Works
3	32	Jeff Floyd	1	CW Dominator	A A	Novak 1X	Arrows Foam	Arrows Foam	Custom Works
4	31	Brian Langdruff	3	CW Dominator	C N	Novak T-1X	Losi Qualifier Foam	Losi Qualifier Foam	Custom Works
5	31	Dave May	8	CW Dominator	E D	Novak T-1X	Arrows Foam	Arrows Foam	Custom Works
6	31	Tom Adams	4	CW Dominator	P -	Novak 1X	Gizmo Foam	Gizmo Foam	Custom Works
7	31	Jack Rimer	9	CW Dominator	R O	Novak 1X	Losi Med. Foam	Losi Med. Foam	Custom Works
8	31	Greg Banks	10	CW Dominator	E U	Victor	Arrows Foam	Arrows Foam	Custom Works
9	30	Shawn Hamby	5	CW Dominator	P T	Novak T-1X	UFRA Soft Foam	UFRA Soft Foam	Custom Works
10	30	Brian Hawthorne	6	CW Dominator		Novak 1X	BoLINK Yellow	BoLINK Yellow	Andy's



# ROAR DIRT OVAL NATIONALS



Trackmaster belt-drive tranny to 1st place on the grid, with 30 laps in 4:02.82. Two seconds behind came John Smith (last year's inaugural ROAR National Sprint Car champ) driving an RC10 JG prototype sprint-car kit with a stock gearbox and a Peak Performance motor. Lemanczyk and Smith were the only ones who managed to turn 30 laps, and Doug Suggs took 3rd with 29

laps. (His Cam-powered RC10 had a scratch-built conversion and a stock gearbox.) Easily winning my award for best hometown name, Jim Gouge, of Rancho Cucamonga, CA, qualified 4th with an RC10/Ascot sprinter, a Fast Eddie transmission and a Twister motor.

Win Carter used Twister propulsion and an RC10 with an MIP tranny to take the TQ spot in the 66-strong

2WD Modified Class, while Ed Krupa qualified 2nd with his RC10, a stock gearbox and a Peak Performance motor. Revtech power and a Terminator with a J-Car rear carried Rob Cutman to 3rd, and Cliff Lett took 4th on the grid with his Reedy-powered RC10. He ran a prototype Associated gearbox, and he couldn't give me any details about it, but I'll have more information after the

## SMITH "HAMMERS" THE COMPETITION FOR HIS SECOND STRAIGHT TITLE

**T**HE CALIFORNIA STUD; the Hammer. These are both names by which John Smith of Carson, CA, is known. He's also known as the Champ, because by winning the Sprint Car Class, Smith is now the only two-time ROAR Dirt Oval National Champion.

Smith seems to have the right personality to be a full-size sprint-car driver, because he always appears to be confident that he'll come out on top if he tangles wheels with someone. He went nose to nose with another driver when a question about rules arose. The Champ wasn't even involved in the situation, but had simply been consulted. Suddenly, the other racer was all over him, and, while he remained calm, he let it be known that he wouldn't endure much more of the tirade. The other racer realized his situation and seemed to "melt" away into the crowd, while a small grin spread across Smith's face as he returned to his pit to work on his car.

Speaking of cars, Smith has an interesting



John Smith at work on his sprint car before the Mains.

one. Being a member of the JG Manufacturing race team, his car was made of JG parts. The base of the car is an RC10, and the chassis, large wing, nerf and rear bars are made by JG. The roll cage is actually the cage from an RCRC Ascot Super Modified Kit, and Smith likes it because it's lower than most roll cages and lowers the car's center of gravity. He uses a stock RC10 gearbox built by fellow JG team



John Gudvangen (left) and Mike Bodman cheer Smith's Sprint Car National Championship.

member Steve McAfee. I couldn't get too many details, but it involves replacing the outdrive gears and dogbones with ones from a Yokomo. It's the most free-spinning stock gearbox I've ever seen, and the body is made by Premier Designs.

After Smith's strong performance this year, there's no reason to think he won't repeat it next year. ■

World Off-Road Championships.

The last, and most exciting, class to qualify was the 4WD Modified. Nine of the 10 cars in the A-Main were Dominators. In fact, of the 90 entrants in Modified and 49 in Stock (139 total), there were approximately 125 Dominators, 10 SRP 1s, and a few Yokomo YZ-10s and Kyosho Optimas rounded out the field.

Warren Darby TQ'd his Revtech-powered Dominator with 36 laps in 4:02.96, and Cliff Lett took 2nd with a Reedy motor. Cam motors put James Griffeth in 3rd and Chris Smith in 4th.

In Concours, 1st, 2nd and 3rd-place honors were to be awarded. Sprint cars were judged along with outlaw wedge bodies for the 2WD and 4WD Classes, and this almost made it a competition between the sprinters' chrome and the wedges' large paint surfaces. The judges seemed to be more impressed with paint than with chrome, as the three top places went to wedges. Dennis Dorrity of Franklin Lakes, NJ, took 1st with a JG Outlaw Wedge T-Bird painted by Lee Ashby. The red,

black, white and yellow body sported a scale fuel cell with a red cage. Second place went to Ken Canniff of Holiday, FL, who used a Superior body on an SRP 1 with a wild, multi-colored airbrush paint job by Dan Toll. The molded engine even had a working blower belt connected to a tiny electric motor! Third place went to Bill Henning of Lansdale, PA. His RC10 had an Andy's Wedge Corvette with a California Raisins motif that was all hand-painted, including

the "Raisin Dude" on the hood. You might recognize Bill's name, as he does most of the paint jobs on my cars, and I've mentioned him in previous articles. Do I know how to pick 'em, or what?!

Although cold, cloudy and very threatening, Sunday's weather held long enough for us to complete the Mains. The 2WD Stock A-Main was a runaway affair, as Slammin' Sammy Blackwell drove his TQ RC10 to a one-lap victory over 2nd-



With three cars already tangled in the turn, one car makes it through on the inside.

## 2WD MODIFIED A-MAIN

Fin.	Laps	Name	Q	Car/Tranny	Motor	Speed Control	Front Tires	Rear Tires	Body
1	34	Cliff Lett	4	RC10/Prototype	Reedy 14 D	Novak T-1X	Yokomo Foam	Advanced Grand Prix	Associated
2	34	Eddie Knoles	5	Cox Scorp./Fast Eddie	Twister 12 T	Victor 4A	CKW Med. Foam	Advanced Grand Prix	JG
3	33	Martin Buchanan	8	RC10 Red Ten/Stock	Revtech 14 S	Novak T-1X	BoLINK Green Foam	Advanced Grand Prix	Premier Designs
4	32	Scott Quillen	7	RC10/Stock	Revtech 14 S	Novak T-1X	Pro-Line Waffle	Advanced Grand Prix	Andy's
5	32	Rob Cutman	3	Terminator/J-Car	Revtech 17	Novak 1X	RRP Foam	Advanced Grand Prix	Andy's
6	31	Ed Krupa	2	RC10/Stock	Peak Perf. 14 S	Novak T-1X	RRP Foam	Advanced Grand Prix	Andy's
7	31	Win Carter	1	RC10/MIP	Twister 12 T	Novak 1X	Pro-Line Knobbies	Advanced Grand Prix	Andy's
8	31	Steve McAfee	10	RC10/Stock	Peak Perf. 12 D	Novak T-1X	JG Rubber Slicks	Advanced Grand Prix	JG
9	31	Sammy Blackwell	9	TQ RC10/Team Pit Stop	Cam Pro 14 Quad	Novak T-1X	DuraTrax Matrix	Advanced Grand Prix	Custom Works
10	31	John Smith	6	RC10/Fast Eddie	Peak Perf. 12 D	Victor 4A	JG Rubber Slicks	Advanced Grand Prix	JG

## 4WD MODIFIED A-MAIN

Fin.	Laps	Name	Q	Car	Motor	Speed Control	Front Tires	Rear Tires	Body
1	37	Erik Soderquist	5	CW Dominator	Twister 13 D	Novak T-1	Westcott Foam	Westcott Foam	Premier Designs
2	37	Brian Landgraff	6	CW Dominator	Revtech 12 T	Novak T-1X	Losi Qualifier Foam	Losi Qualifier Foam	Custom Works
3	36	Warren Darby	1	CW Dominator	Revtech 13 S	Novak 1X	Gizmo Foam	Gizmo Foam	Custom Works
4	36	Cliff Lett	2	CW Dominator	Reedy 14 D	Novak T-1X	Yokomo Foam	Yokomo Foam	Andy's
5	36	Martin Buchanan	9	Superior SRP 1	Revtech 13 S	Novak T-1X	CKW Med. Foam	CKW Med. Foam	Premier Designs
6	35	Tom Adams	7	CW Dominator	Revtech 14 D	Novak 1X	Gizmo Foam	Gizmo Foam	Custom Works
7	35	James Griffeth	3	CW Dominator	Cam Pro 14 S	Novak 1X	UFRA Soft Foam	UFRA Soft Foam	Custom Works
8	18	Russ Hawkins DNF	8	CW Dominator	Twister 13 S	Novak T-1X	Arrows Foam	Arrows Foam	Premier Designs
9	15	Chris Smith DNF	4	CW Dominator	Cam Pro 14 S	Novak T-1X	UFRA Soft Foam	UFRA Soft Foam	Custom Works
10	1	Bob Fellenbaum DNF	10	CW Dominator	Revtech 13 S	Novak T-1X	CKW Med. Foam	CKW Med. Foam	Custom Works



# ROAR DIRT OVAL NATIONALS



place Terry Troup and 3rd-place Jeff Swartz. After some early lap shuffling, Blackwell established his lead and was never seriously challenged. Troup and Swartz were content to battle it out for the rest of the race.

The 4WD Stock A-main had three cars finishing on the same lap, and Warren Darby eked out a 2-second victory over Chris Doseck of Orlando, FL. TQ Jeff Floyd came just  $\frac{8}{10}$  second behind Doseck, whose 2nd-place finish was impressive, considering he had qualified in the 7th spot and really didn't seem to have much smoke throughout the weekend. His secret? He consistently drove in the same low groove, lap after lap.

For close, open-wheel action, there's usually nothing better than the Sprint Car Class, and the A-Main drivers did their best to live up to our expectations. Top Qualifier Mike Lemanczyk jumped to an early lead over John "Hammer" Smith and John Peterson. Meanwhile, making a lightning-fast charge from the 9th start-

ing spot, Tyler Clements of San Diego, CA, driving an RC10/Big Boy Toy with a Trackmaster belt-drive tranny and Reedy motor, roared up to take 3rd place away from Peterson before the end of the third lap. Clement's race ended one lap later, when a tangle with a back marker sent the car hurtling from the track as all sorts of parts flew off it. Clement's misfortune was Peterson's gain, as he retook 3rd place.

While all this was going on, John Smith grabbed 1st place when Lemanczyk slid high in a turn. Smith kept Lemanczyk and Peterson behind him by putting the hammer down and making great use of the traffic. Peterson was able to finish 2nd when Lemanczyk got caught in a jam toward the end of the race. By winning the Sprint Class, John Smith became the only two-time ROAR Dirt Oval National Champion. (Last year, in Florida, he won the first National.)

The 2WD Modified Class featured a real dogfight between two drivers with different racing styles. Cliff

Lett, a member of Associated's R&D team since last summer, was a study in consistency and patience. I watched him repeatedly pass a member of the unofficial Philadelphia-area branch of the *Car Action* race team. This racer was having a rough time in his heats, but Lett always waited for the right time to pass. Cliff was the 1988 ROAR 2WD Off-Road National Champion, and he has also won major titles in  $\frac{1}{10}$ - and  $\frac{1}{8}$ -scale on-road racing. His varied racing experience gave him the edge.

Eddie Knoles, of Del Mar, CA, is a dirt-oval specialist. He chose a Cox Turbo Scorpion, which is often called the "Dinosaur Car." His own Fast Eddie Transmission is used by some other A-Main drivers and is expected to be available soon from JG Manufacturing. Throughout the weekend, Knoles was fast, but he had to stay clear of traffic to do well.

At the start of the Main, Top Qualifier Win Carter had the car to beat. He moved out to an early half-

(Continued on page 132)

## SPRINT A-MAIN

Fin.	Laps	Name	Q	Car/Tranny	Motor	Speed Control	Front Tires	Rear Tires	Body
1	32	John Smith	2	RC10 JG Proto/stock	Peak Perf. 12 D	Victor 4A	JG Rubber Slicks	Advanced Grand Prix	Premier Designs
2	31	John Peterson	5	Ultima/J-Car	Twister 14 T	Victor Koilfet	Kyosho	Advanced Grand Prix	McAllister
3	31	Mike Lemanczyk	1	RC10 Big Boy/Trackmast	Fantom N/A	Novak T-4	Tamiya Sand Blaster	Advanced Grand Prix	McAllister
4	31	Jim Gouge	4	RC10 Ascot/Fast Eddie	Twister 14 T	Novak 1	JG Rubber Slicks	Advanced Grand Prix	Premier Designs
5	30	Scott Moody	10	RC10 Ascot/ MIP	Black Magic 16 D	Novak 1	TRC Blue Foam	Advanced Grand Prix	Ascot
6	28	Scott Synder	8	RC10 Houge/MIP	Redline 13 T	Novak T-1X	Imex Road Dawg	Losi Off-Road Cut Spike	BoLINK
7	28	Ed Laskey	6	RC10 Ascot/ MIP	Losi 16 T	Novak 1X	Pro-Line Waffle	Advanced Grand Prix	Ascot
8	25	Ed Lands	7	RC10 Scratch/Stock	Cam Pro 15 D	Novak T-4	Pro-Line Waffle	Imex Road Dawg	Scratch
9	3	Tyler Clements DNF	9	RC10 Big Boy/Trackmast	Reedy 14 D	Novak 1X	Cox Ribbed	Advanced Grand Prix	Big Boy Toys
10	2	Doug Suggs DNF	3	RC10 Scratch/Stock	Cam Pro 15 D	Novak 1X	Pro-Line Waffle	Pro-Line Octigrab	McAllister

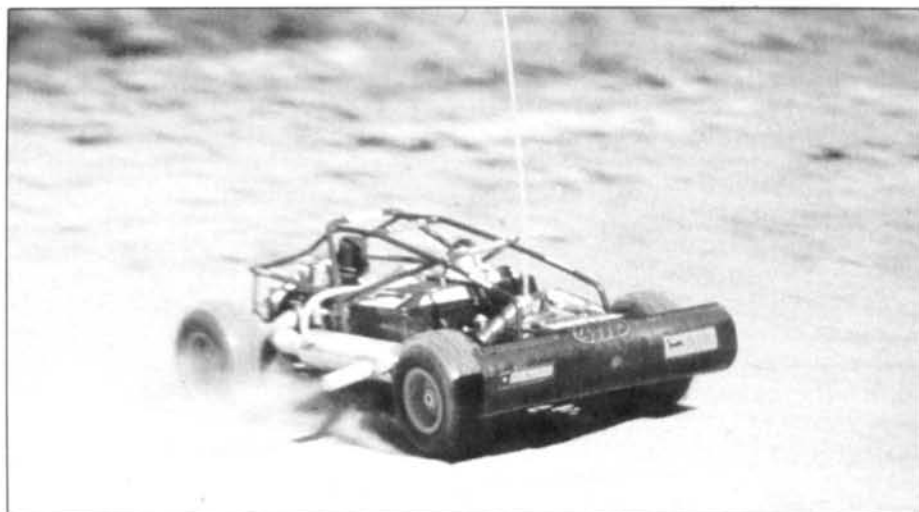
# DIRT DIGEST

by BOB KANE & BILL O'BRIEN

## PISTON POWER

**H**ELLO FOLKS! THIS is Bob writing. Sorry to have been away for so long, but I've been having such trouble getting Bill away from the computer, that I can barely get a word in edgewise. This month, we'll talk about something near and dear to me—gas! (no, Bill; *not* heartburn!)—or, to be specific, gas-powered cars. To move into gas-powered off-roading, we need to know about basic engine operation, engine displacement, horsepower, power/weight ratios and fuel. So let's start burning!

Since some of you might be unfamiliar with its behavior, a little primer on how an internal-combustion engine works is in order. All internal-combustion engines need three things to operate: air, fuel and a way to ignite the air/fuel mixture (usually a spark). Air is readily available (and cheap, too), and it's drawn into the engine through an induction system that usually has a carburetor as one of its components. In the carburetor, air is mixed with fuel that's drawn from some onboard fuel supply (usually a gas tank; not as cheap!) and then sent into an engine's cylinder(s). (This process could be the subject of an entire column.) Inside the cylinder, there's



*The 1/8-scale Hobby Lobby Hunter is an affordable, pre-built, off-road machine.*

a piston that moves up and down. The air/fuel mixture usually enters the cylinder when the piston is at the bottom dead center (BDC) of its travel inside the cylinder. The piston, which is attached to a connecting rod (conrod), moves upward inside the cylinder, so compressing the air/fuel mixture. When the piston reaches top dead center (TDC) of its travel, the mixture is ignited (in an R/C engine, usually by a glow plug) and burns. The burn-

ing mixture produces hot exhaust gases that rapidly expand and force the piston downward in the cylinder. This movement also forces down the conrod, which is attached off-center to the crankshaft. This off-center attachment translates the downward motion of the conrod into a rotating motion of the crankshaft. The moving crankshaft is usually hooked up to some type of transmission (a centrifugal clutch) that's attached to some type of drive system (a chain or belt), and

this ultimately turns the wheels and propels the car. The expansion of the hot gases is so forceful that it carries the piston past BDC going down and starts the upward compression motion of the piston for the next shot of air/fuel mixture to be compressed and burned.

Whew! That was a lot! My apologies to the mechanical engineers out there! What about intake timing? What about exhaust gases? What about 4-cycle vs. 2-cycle? There isn't room here to discuss



*This Kyosho Stinger represents a new trend in our hobby: 1/10-scale gas power. Some of the newer 1/10-scale gas cars feature an extremely handy recoil pull starter.*



everything, but I'll tell you something about displacement (which is what Bill has done to me for the last few weeks!). Appropriate engine displacement varies according to a car's scale. This chart can be used as a general guide for choosing a gas engine that's the right size for the scale of your car:

**Table 1**

Scale	Recommended engine size
1/12	.049 to .10 cubic inches
1/10	.10 to .15 cubic inches
1/8	.21 to .25 cubic inches

Displacement is determined by the diameter of the engine's cylinder (bore) multiplied by the distance that the piston travels from BDC to TDC (stroke). No-

tice that as the scale increases, the recommended engine size also increases. There are two reasons for this: First, a larger car can accommodate a physically larger engine; second, a larger car requires more horsepower to move it at the same speed as a smaller car with less horsepower.

Horsepower? You might think "How is horsepower applicable to my car?" A long time ago, when there weren't any cars (what would I do without my RC 500?!), people got some horses and had them pull sleds of various weights. They learned that one horse could pull a 550-pound sled 1 foot off the ground in 1 second. In other words, 1 horsepower (hp) equals 550 foot-pounds per second, and it tells us where the phrase, "Let loose the ponies" comes from.

So now your question is, "How does

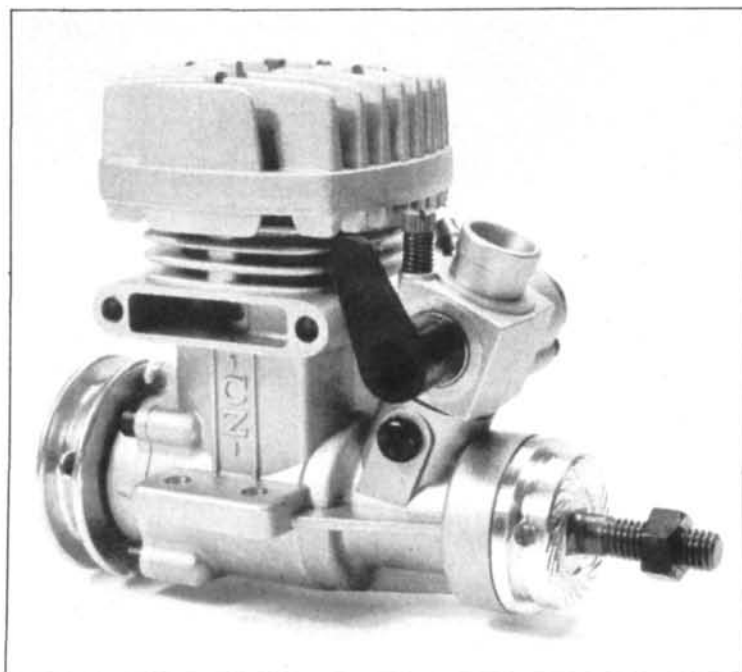
an R/C engine stack up on the ponies?" Table 2 contains ratings for some popular O.S. R/C car engines:

**Table 2**

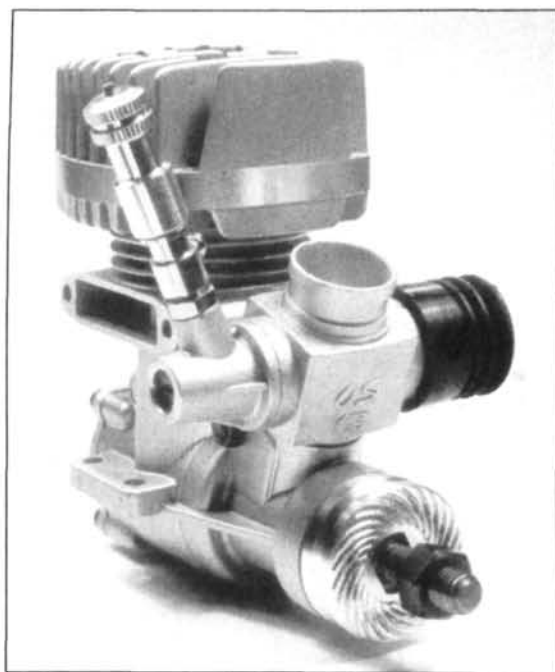
Engine:	Displacement	Output (hp)
O.S. Max		
10FP-B	.10 cubic inches	.27
CZ-R	.12 cubic inches	.43
21VF-R	.21 cubic inches	1.5

These hp ratings are real figures, *not* scale numbers. So how does a gas-powered R/C car compare with a full-size sports car? Direct comparisons are difficult to make, but one way of comparing them is by using power-to-weight ratios. Essentially, a power-to-weight ratio means the amount of power that's avail-

*(Continued on page 114)*



*Left: The O.S. CZ-1 has a ball-bearing crankshaft and ball-bearing-mounted rear starter pulley for the non-recoil cord starter. Pulley has a cone-shaped end for electric starting, too.*



*Right: The slide-throttle carbureted O.S. Max .21 is for 1/8-scale buggy engines. The upright needle valve is very accessible.*

# HI-RIDER VETTE

(Continued from page 36)

gave the car a rather out-of-scale appearance, but one look at the Hi-Rider tells you that this is no longer a problem.

The Vette pictured on the box can be duplicated. It shouldn't be too hard to do if you use the decals that are included in the kit and have some red, white and blue paint. I took the easy way out. I packed up the Vette body and shipped it off to Motion Graphics\* in Maryland. With only a mention of a main color preference, I left the rest of the paint scheme to the magic wand of Richard Muise, the grand wizard of Motion Graphics. A quick glance will tell you that the result was desirable, to say the least!

**PERFORMANCE:** I went to a couple of local off-road tracks to test the Hi-Rider Vette. The first track was relatively flat and had a number of turns and short straightaways, which proved to be a good test of cornering ability and acceleration. The second track, which was considerably larger with wide, sweeping turns and some big jumps and bumps, provided a good test of speed and flight characteristics.

At the first track, the Vette accelerated quickly, usually leaving the rest of the

production class trucks behind at the starting line, because, while it looks the same as the standard Mabuchi motor, the Le-Mans 05 stock motor had a little more under the hood. Like other Kyosho trucks, the Vette proved to be a little top-heavy going into the turns. Through the wider turns, it pushed a little, and this helped to keep it on its feet, but it requires skill to keep the Vette top-side-up in the tight turns. About half of the time when it was showing signs of rolling, the differential (which works very well compared with those of other trucks I've tested) sent the power to the inside rear tire as it came off the ground. This is just how it's supposed to work, and it kept the Vette going through turns without rolling. The other half of the time, the turns proved to be too much for the differential to handle, and the truck flipped. While monster trucks are inherently top-heavy, the Hi-Rider is more likely than others to roll. Nevertheless, I won every heat by paying close attention and doing a little counter steering when it started to roll.

At the second track (the site of the ROAR Region I Championships in Bethel, CT), I didn't run the Vette competitively against other trucks, as it had already proved itself in that category, but I did have an open track between heats to

put it through its paces. On this larger, faster track, the Vette showed excellent speed (for a box stock truck) and good handling through the wider turns. It has a tendency to push a bit, but with all the steering available after the aforementioned modifications, I was able to make it through at full speed, with an occasional correction to keep the truck upright. The Vette didn't do as well through the tighter sections of the track, where some little bumps are designed to make driving tougher. While going through the turns, the Vette heeled just as it had done before, but the bumps put it on its roof. I got my cordless Dremel out and drilled holes in the back of each wheel to relieve some of the pressure. This improved the handling enough to get it through the turns and over the bumps, but I still had to keep an eye on it.

Going over the large jumps with the Vette was awesome. With a long runway before the jump, I was able to get up to top speed, which seems to be the only way to determine if it's going to fly straight. With the Vette's top-heavy profile, I wasn't at all confident that landings off these jumps would be pleasant. Surprise, surprise! This thing soars like a bird! Each of the jumps was a smooth, stable flight

(Continued on page 90)

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## HI-RIDER VETTE

(Continued from page 86)

with a four-point landing (provided there was a proper approach). Because of the oil-less shocks, poor dampening caused the front tires to hit the fender, but drilling holes in the rims helped.

The Hi-Rider Vette held up well through serious testing. Apart from its tendency to roll, this truck is a good performer. The front axles are soft (I managed to bend one of them), but they're inexpensive. The new speed control performed extremely well. It doesn't do much more in terms of speed or acceleration than with the older units, but you'll have a tough time burning this one out. I liked the fact that there's only one reverse speed, because you should only need reverse to back out of trouble. And if you like to get up to full speed and jam it into reverse, the single speed will help to protect the speed control and the differential.

The Pulsar 2001 radio system proved to be a winner, as well. The truck was designed to use this system, so if you want a trouble-free installation, this is the easiest radio system to use.

The Hi-Rider Vette is one of the fastest out of the box and, while it has a few

(Continued on page 98)

# REEDY Modifieds

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(Graph shown represents actual core readout of Reedy Modifieds motor.)

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## TRACK REPORT

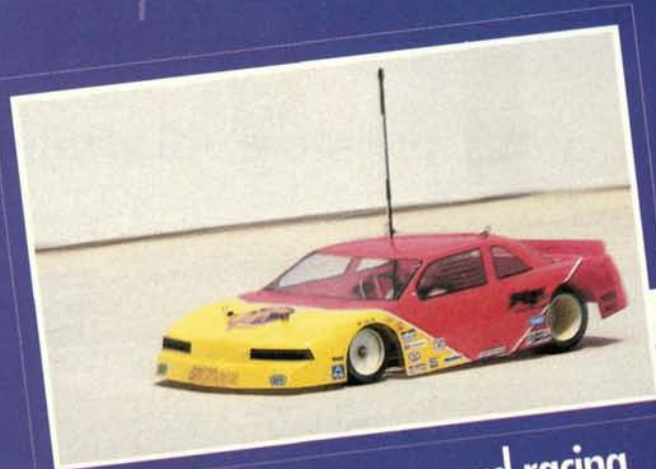
by FRED MURPHY

**"T**HE DIFFERENCE BETWEEN men and boys is the price of their toys." That's the slogan on the bumper sticker I found in the box of the new BoLINK\* Eliminator Sport. If this slogan really had some element of truth, then I think we're all about to see the price/age barrier shattered.

The Eliminator Sport is BoLINK's newest on-road entry, and, from its name, it's obvious that the company has taken a hard look at the on-road market and has

# BOLINK ELIMINATOR

S S P P O O R R T T

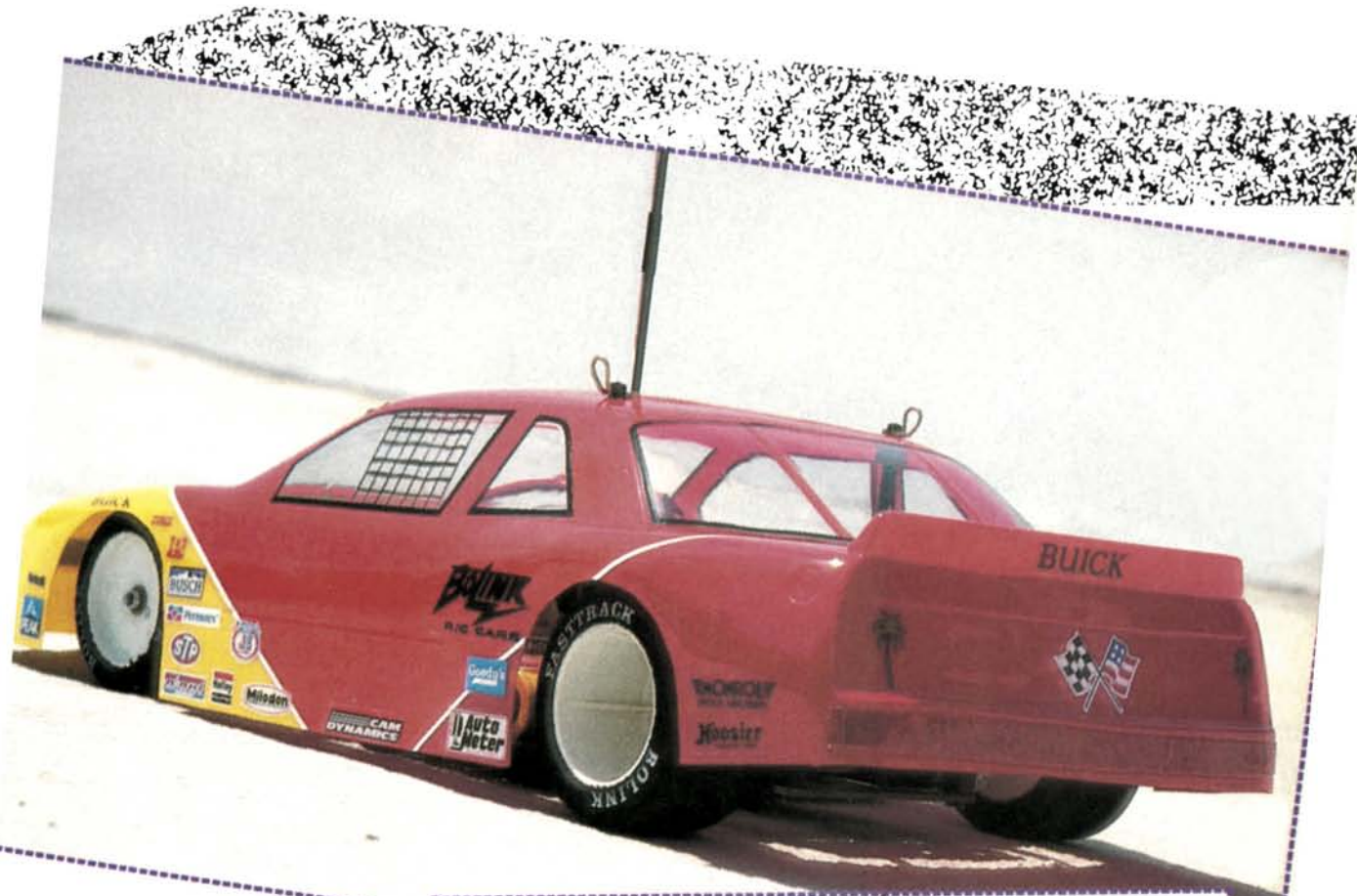


Quick and easy on-road racing

determined that sport-class drivers and average R/C fans have been left in the dust by the pros. This not only goes for technology, but also for the wallet. That's why they're marketing the Eliminator, with which they shatter the age/price barrier. They have taken the successful technology of the Eliminator and, through careful research, created a sport version of the kit that can be bought in two forms: with or without electrics.

For my test, I chose to build the kit that includes electrics. On inspecting the kit, I was surprised to find that I only had to add batteries and a radio; that isn't true of many on-road competition cars. Wow!—a *complete* kit that includes a speed controller, a motor and tires that are pre-mounted and trued. It's about time someone provided an affordable on-road car that's so complete that you don't have to make five trips to the hobby shop to buy additional parts before you can get the car running. The Eliminator Sport's best feature is that it will allow you to be very competitive *without* the big-buck extras.



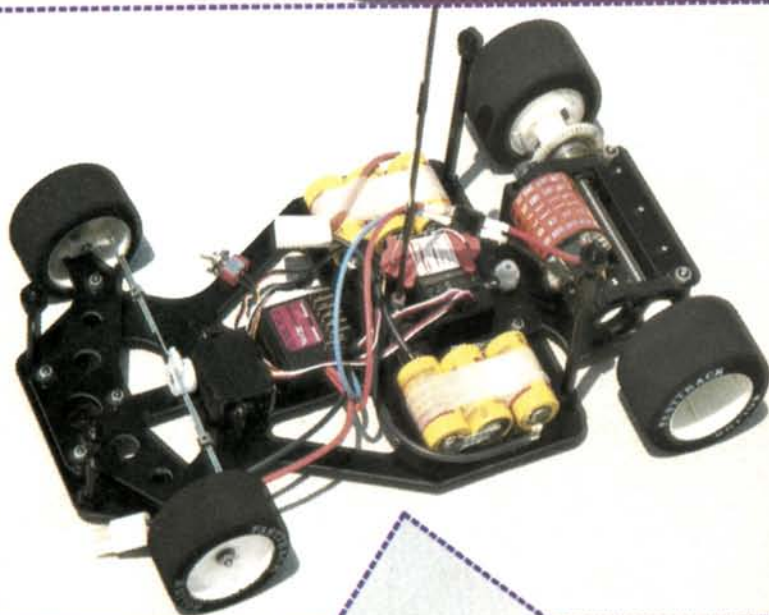


**THE KIT:** The BL-1368 kit includes a ROAR-legal stock motor, which, by the way, is a Yokomo stock motor with the BoLINK label. Also included are: the very reliable 4620 resistor speed controller; a set of mounted and trued BoLINK tires and wheels; a black fiberglass chassis; a T-plate and a very light front-end plate; a pair of reversible motor blocks; and a hot-looking '88 Buick Grand National body. You even get an innovative battery hold-down kit that keeps the 6-cell saddle-pack secure, even in the worst crashes.

**ASSEMBLY:** Assembly instructions are very easy to read and allow you to build a rolling chassis in 10 easy steps. This should take no longer than 1 to 1½ hours, even for a beginner. When the rolling chassis has been assembled, you'll be able to install the radio system and the batteries and then prepare the body.

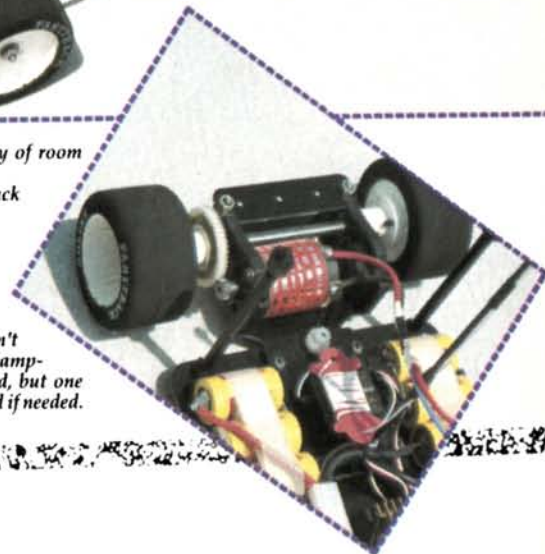
The BoLINK instruction manual gives helpful hints on body painting, assembling your own saddle-pack battery and modifying the assembly procedure if you're using servos other than the Futaba® S-32 or the Novak® NES-1A, for which the Eliminator's chassis has been pre-drilled.

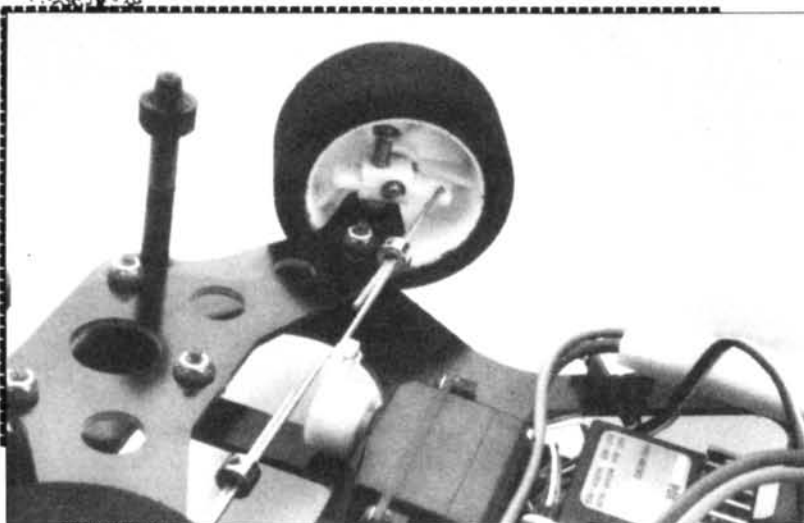
It's easy to mount the speed controller, because BoLINK has taken the trouble to give you a pre-wired unit that can be



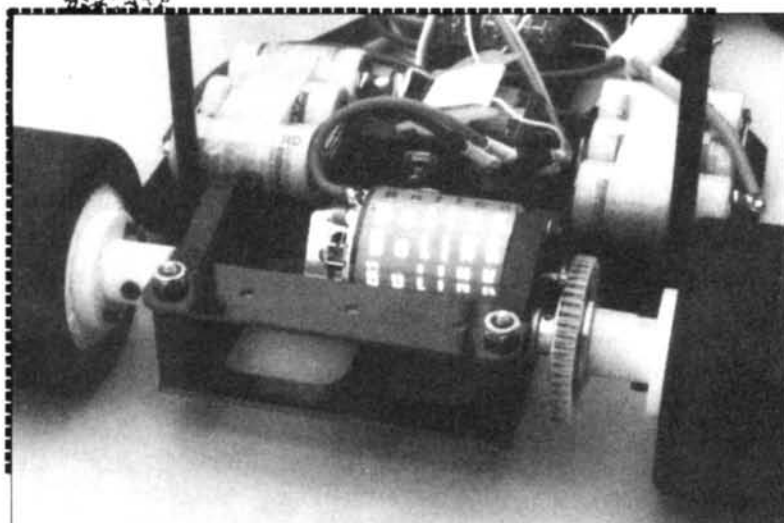
*Above: There's plenty of room to mount your radio equipment on the black fiberglass chassis. This car gives newcomers easy access to 1/10-scale on-road racing.*

*Right: To keep costs down, BoLINK doesn't include a shock for dampening on the rear pod, but one can easily be attached if needed.*





*BoLINK uses its Eliminator front end on the Sport. No front-end upgrade is necessary to turn the car into an Eliminator.*



*Nylon motor/axle blocks are used on the rear of BoLINK's Sport. Also notice BoLINK's new stock motor.*

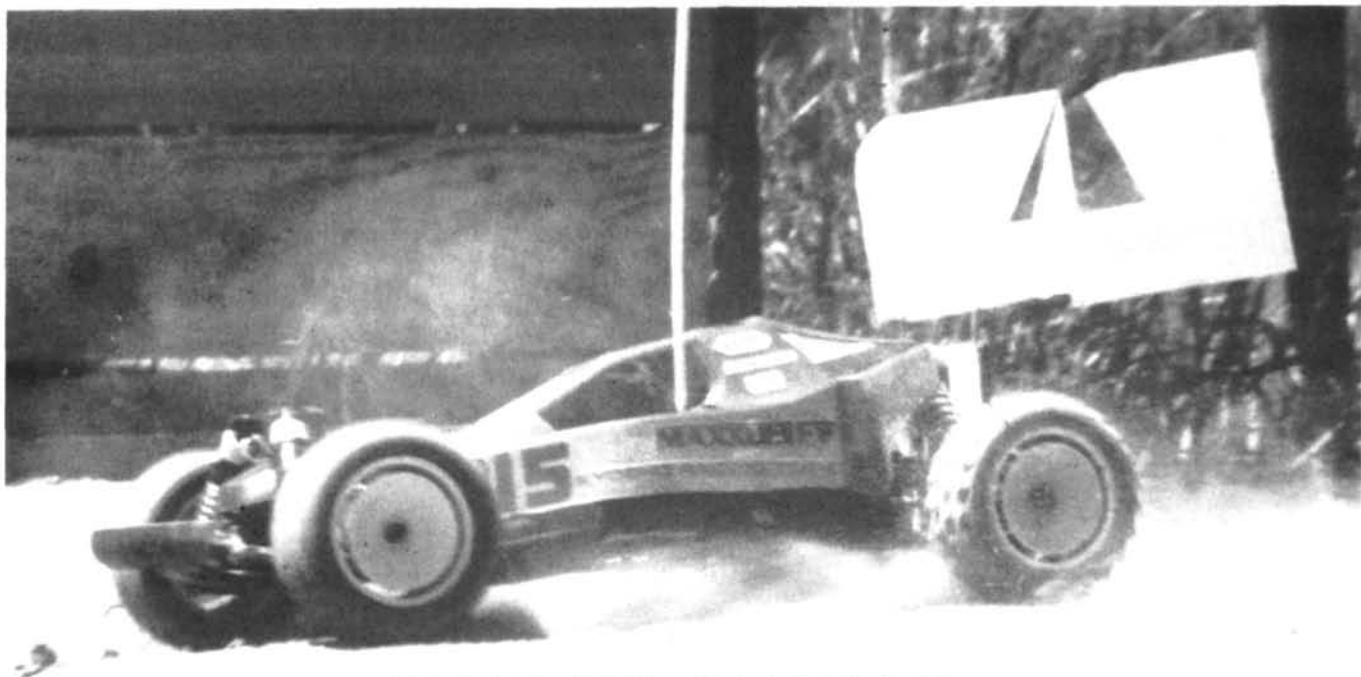
mounted on almost any type of servo. You'll only have to alter the speed control if you plan to use the car's battery pack to power your radio instead of using the one the radio system comes with. Once again, by including a very easy-to-follow wiring diagram for this modification, BoLINK has made this as easy as possible for you.

Going from box to road takes only 3 hours, and this includes the time taken to assemble a 6-cell battery pack. The last five pages of the instruction booklet contain black-and-white assembly photos, lists of replacement and optional parts, and racing and set-up tips, which are the most important things of all for novices. These tips include info on everything from fine-tuning the caster adjustment on your car's front end to adjusting side roll or the amount of twist the T-plate has in relation to the chassis. Even the front springs get some attention, and there are tire and traction recommendations, too. As you know, tires come in a variety of compounds, and their differing performances can make all the difference to *your* performance. The kit includes blue-dot tires for the front (a firm compound) and green-dot tires for the rear (a medium compound). For reference, the front tires can be obtained in orange, blue, or green compounds that are extra-firm, firm and medium, respectively. Rear-tire compounds are blue, green, green/yellow and yellow, and this translates to firm, medium, split medium/medium soft and medium soft.

On any on-road car, good handling results from having properly balanced front and rear traction. To make your car handle well, you should always try to run the hardest combination of tires. If out-of-the-box tires don't seem to give you the traction you want, BoLINK offers the following recommendations. If your car has good front bite but the rear is a little loose, use a traction additive like

*(Continued on page 126)*





# BUDGET RACER

## Maxxum performance modifications

**I**N THE LAST issue of *R/C Car Action*, I reviewed the Kyosho\* Maxxum FF: a front-wheel-drive, 1/10-scale off-road car.

As I promised, I took the Maxxum for some off-road racing, and the results were less than splendid. I raced the car on the killer layout at Sacramento MiniWheels Raceway. There, the turns bank so steeply that a car could get vertical and, if its speed wasn't right, it could roll upside-down off the turn. The track elevation changes abruptly, and one downhill stretch is so steep that it's like a ski jump. At this point, most cars don't touch the track until they reach the bottom of the hill, and then they're immediately faced with a tough double jump. Add a bunch of tall moguls and a couple of ramp jumps, and you have one of the most interesting off-road racetracks imaginable.

Unfortunately, I never sorted out the Maxxum's handling problems well enough to come in better than 6th in the 4WD Stock Class, although at one point, the car was actually up to 3rd.

When I first tried the Maxxum on the track, the stock differential was altogether too loose to work well. Full throttle caused one of the front wheels to spin a lot (and I couldn't predict which wheel would spin at what time), and the 4WD cars just ran off and left me in the dust. I substituted a Kyosho adjustable diff

(which fits perfectly), and spent some time experimenting to see just how tight the diff has to be to work well.

I guessed that it should be set at just about lock-up, so both front wheels would be driving at the same time, but this doesn't work as well as I thought it would. With the fronts locked together, they pulled like mad, and this made the rear end bounce and swing so much from side to side that on the front straight, which was pretty smooth, I couldn't use full throttle for more than half the distance, or the car would dart out into the fence or the infield. (Take your pick which one!)

Since the track had a rather hard surface, I clipped the lugs on the rear tires as

suggested in the instructions. In addition, I pulled the rear wheels off the Raider and stuck them on the front end of the Maxxum. The pin spikes definitely helped improve the bite and got the power to the ground more effectively, but the front-to-rear balance was still a long way from correct.

Unfortunately, Kyosho didn't see fit to make the spring pre-load adjustable, so I couldn't soften the rear springs or stiffen the front-spring settings to help the problem.

I did change to 10WT shock oil in the rear, and this seemed to help a little.

When a manufacturer produces a car that's based on untested technology, I think the suspension should be made to be as adjustable as possible, because it takes a lot of experimentation to get solutions for some of the handling difficulties.

A second major problem is the way this car takes jumps. As you might expect, a FWD car with a weight bias to the front wheels isn't a good flier. The Maxxum tends to land nose down. Whatever you do, don't remove the front bumper/skid plate, because it's the only thing that keeps the car's chassis from digging into the dirt and flipping over onto its back.

This tail-up jump attitude is also a problem on moguls, because if the driver gets off the throttle at the wrong time, the car noses into the bottom of the next bump and, even with the bumper/skid plate, the Maxxum flops over onto its top.

The heavy front end also causes a lot of

by DICK BRINTON

"push" when you're trying to power around turns, and the car tends to run very wide. I was frequently passed by cars that ducked into the inside lane at a turn and then just sped away while the Maxxum slid to the outside. Unfortunately, the speed controller doesn't provide brakes, and this car really needs them. With brakes, I could at least have stuck in the inside lane and made passing cars take the long way around. If you do put brakes on your Maxxum, remember you're stopping or slowing the front wheels. If you brake hard going around a turn, the rear end will probably pass the front! Try braking while the car is traveling in a straight line as it approaches a turn. When you get into the turn, apply as much power as you can use while still holding the line you want.

Weight was the last problem I dealt with. The Maxxum tips the scales at 3 1/4 pounds, which is 1/4 pound too light for the 4WD class. I would like to have added that 4 ounces to the center of the car, but I tacked it onto the rear, because there it seemed to reduce the bouncing and wild swinging that was causing so much trouble.

I'm sure that by changing to fully adjustable shocks, adding an electronic speed controller with brakes, experiment-

### And Now, the Good News!

On the dirt oval, the Maxxum seems to have a slight edge. The 4WD cars have to contend with twice the drive-train load, since they all have at least one more differential and assorted drive gear. On the off-road track, the traction advantage of 4WD is just too much for the Maxxum to overcome, but on the oval, it's a different story.

To get the Maxxum handling well on the dirt oval I had to make some major changes. While I didn't have to be concerned about jumps, there was still that messy "push" to correct and, of course, I had to get rid of that rear-end, side-to-side bouncing and swinging.

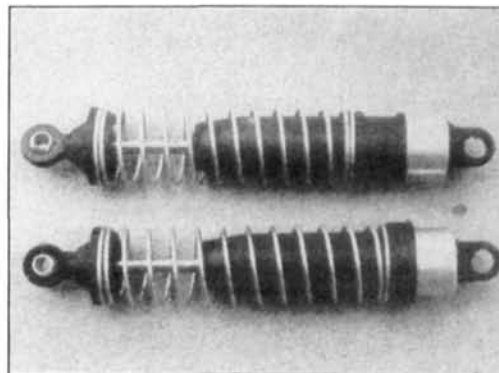
Kyosho built some good features into the Maxxum, and they really helped. The shocks have a series of lower mounting holes that I used to lower the Maxxum to the max! This wouldn't work on an off-road track, but on the smooth oval, getting the car as low as possible improves handling.

Then I cut the spring lugs off the rear shocks, added the spare front spring spacers and, in this way, reduced the pre-load by half. This really helped the rear-end traction, but the car still wandered down the straights too much.

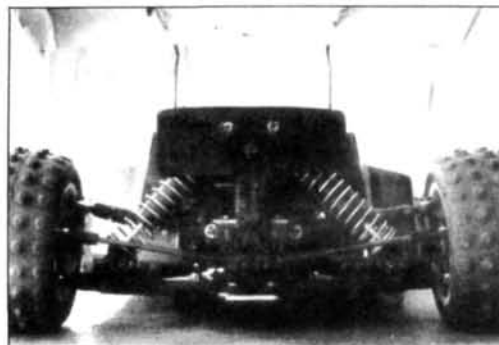
I decided to turn to aerodynamics for the solution. I mentioned that this car had a "joke" for a wing; well, not any more. Using 1/4-

inch ply, I made a wing mount and attached it to the shock tower at the very rear of the chassis. Then I used an Associated\* wing with some homemade side fins.

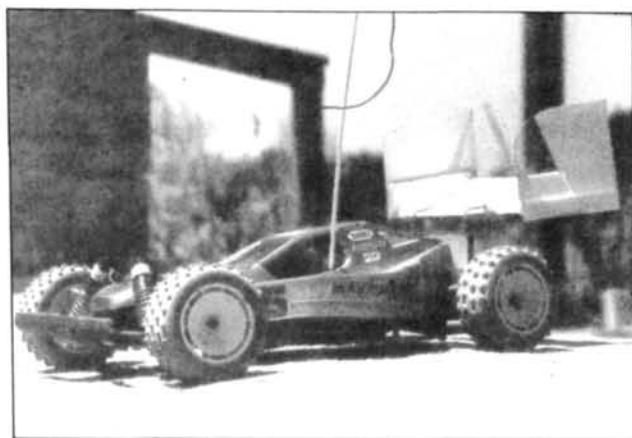
I felt that this car needed a vertical stabilizer—something to keep it headed in a straight line and get rid of the side-to-side



Here you can see the modifications that were made to the rear shocks. On the top is the stock shock. On the bottom shock, the lugs were cut off and an extra front spacer was used for pre-load.



View of rear end shows the lowered oval ride height, multiple shock-mounting holes and a fabricated wing-mounting system attached to the shock tower.



ing with tire changes, adding an adjustable differential, developing a wing (the one provided on the car is a joke) and practicing a lot, you might become an off-road contender with your Maxxum, but there are far too many very good 4WD cars out there to make doing all this with the Maxxum worth the effort.

motion (or "yaw") I mentioned. On airplanes, yaw is controlled by the vertical stab in front of the rudder. (Notice the size of it on modern jet aircraft.) Using servo tape, I stuck 160 square centimeters of vertical stab (side fins) onto the rear wing (10x8cm each side, or 4x3 1/8 inches). To help hold the rear end in place, the wing angle is adjustable for downforce, but with the side fins, little downforce is required, so don't run a steep, high-drag, wing angle.

The results with this new wing are amazing. I've heard some people say that wings and spoilers don't work on these cars because the cars are too small and their speeds too low. Don't you believe it!

On the oval, the Maxxum went from "undriveable" to rock solid. Just to check, I pulled off the wing and tried the car without it: I never got up to full throttle before the car spun out. With the wing, I

(Continued on page 130)



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## HI-RIDER VETTE

(Continued from page 90)

design flaws, such as the tendency to roll, poor steering (following the instructions) and soft front axles, these problems can be overcome. With a bit of tinkering, the Vette is a decent performer and a lot of fun.

\*Here are the addresses of the companies mentioned in this article:

**Kyosho and Pulsar;** distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

**Motion Graphics,** P.O. Box 1590, Westminster, MD 21157.

## SCOPING OUT

(Continued from page 49)

to keep the instruction book handy and pay close attention to the program switches' "open" and "closed" settings.

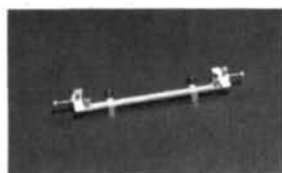
The only problem occurred when the controller shut down once, owing to the

(Continued on page 108)



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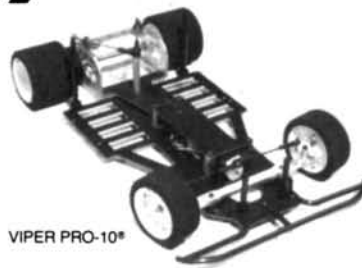
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TAMIYA

# VANQUISH

by BOB GAGNE

## SHAFT-DRIVEN POTENTIAL



**A**T FIRST GLANCE, you might think that the Van-

quish is just an inexpensive version of its

Tamiya\* stablemate, the Avante, but when you get to know it better, the seemingly subtle differences between them become more obvious.

After about a year's experience with the Avante, Tamiya has addressed most of the problems encountered by the first Avante owners. Gone are the aluminum rods that bend and break during relatively insignificant crashes and jumps. Gone is the under-cowling that must be removed before changing the battery pack. Gone are the ball links that have to be removed before removing the body to service and adjust





the radio gear. Gone are the steering-linkage ball joints that are just riveted to the steering plate and soon loosen and become sloppy. These Avante shortcomings have all been corrected in the Vanquish!

In addition, Tamiya has improved the car's overall design. The Vanquish is 5½ ounces lighter (adding a little speed), ½ inch longer in the wheelbase (adding more stability over the bumps) and ¼ inch wider in both front and rear tracks (increasing control through the turns). But this article isn't a shootout comparison of the two cars; I'll assess the Vanquish on its own merits.

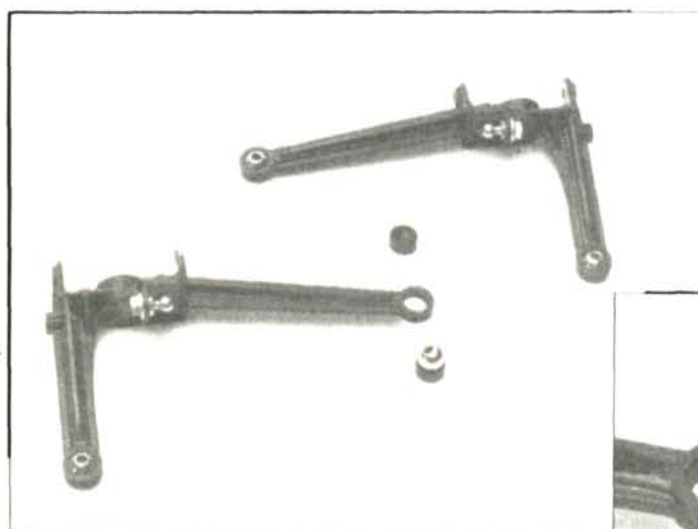
**ASSEMBLY:** Tamiya has done it again! They should get an award for their excellent instructions. Each page has a legend that shows and labels the parts that you'll

need for the assembly steps described there. The *full-scale* drawings in the legend tell you in which parts bag you'll find the needed hardware. Each plastic part in the diagram-type instructions is labeled with a number and letter that identify the tree to which it's attached.

One thing could confuse a beginner: Occasionally, a piece of hardware is pictured in the diagram but not shown in the legend. If you usually lay out all the parts needed for each step before you start that step, you'll sometimes miss a part. Also, optional parts and their Tamiya part number should be included in the legend along with the supplied parts. Tamiya does provide a diagram showing these optional parts, but it's right at the *end* of the instruction manual, so you could miss a step where the substitution of an optional part (e.g., ball bearings) is suggested. However, this is really getting picky, since those who build this kit will probably have built a car before, and the instructions, as is, do make the car a snap to assemble. Tamiya also includes niceties, like a four-way wrench that really fits the nuts and a plastic tool for installing the balls in the pivots in the rear wishbone arms. The parts fit together easily, so assembling this kit should even be easy for a beginner.

Tamiya Thread Lock is recommended for all metal-to-metal screws and nuts (except for self-locking nuts), because R/C cars vibrate a lot, and nuts and bolts loosen quickly if you don't take precautions to prevent it.

Assembly begins with the center diff and the rear transmission case. This is an automotive-type planetary and bevel-gear setup. The drive-gear differential must be assembled very carefully; if the diff isn't tightened enough, the cap screw will come out. This is a good place to use a little thread-locking compound. If you apply it to the threaded end of the cap screw, it should help to keep the diff adjusted. For the smoothest, most friction-free transmission

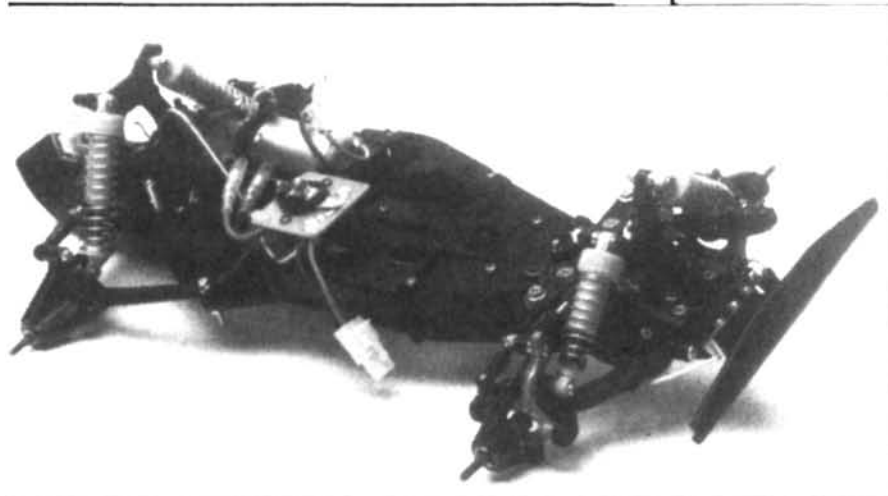


Above: Trailing-type rear wishbone uses steel pivot balls that must be installed during assembly. All major suspension parts are made of ABS plastic.

Right: Close-up of rear-suspension pivot parts and the supplied Tamiya installation tool. No broken ends, and no marks caused by pliers on the metal parts' finish.



# T

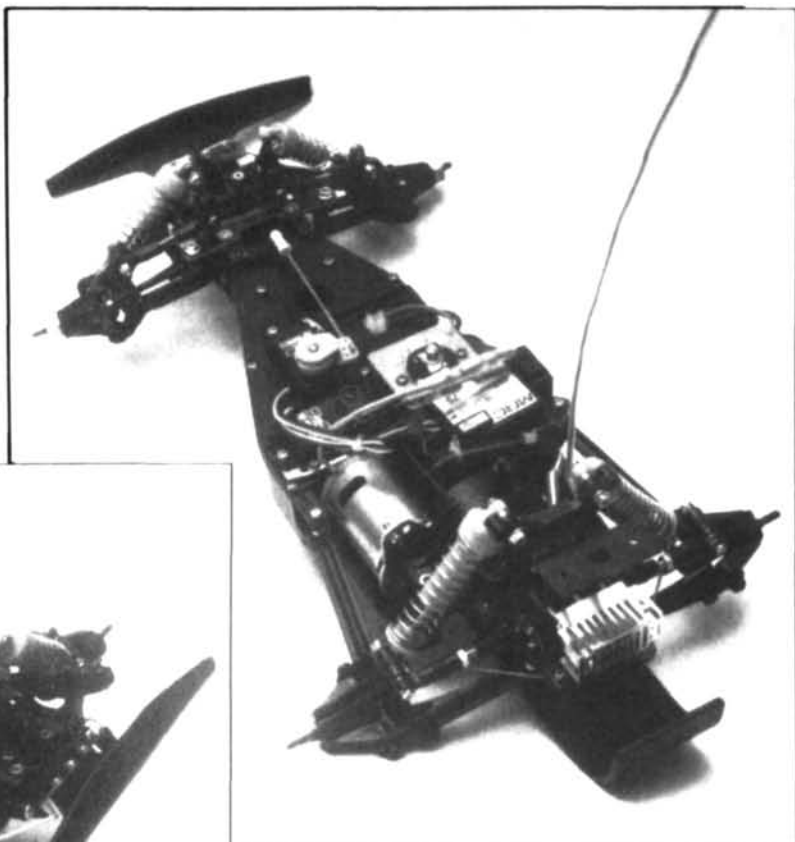


*Above: The completed Vanquish chassis ready for radio installation.*

operation, I replaced the nylon and bronze bushings with the optional ball bearings. (This is *important!*)

Before installing the tranny case on the chassis tub, you must completely assemble the rear stabilizer rod plate, on which the antenna holder is installed. This is a neat piece of aluminum hardware that holds a hollow nylon antenna mast. It works well and should fit most other kits, too.

When the rear transmission has been assembled



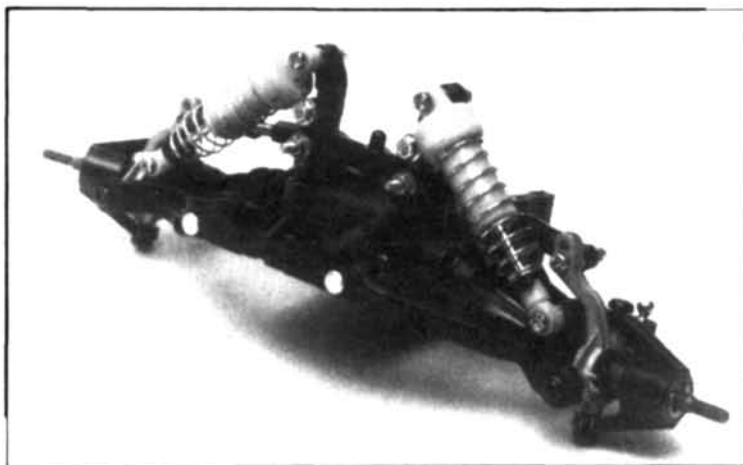
*Above: Both servos and the motor are located well left of center, but their weight is counterbalanced by the battery.*

and installed on the chassis tub, the rear suspension must be bolted up. You then move to the front transmission, where (like the rear) Tamiya uses a bevel-gear-type differential driven by a solid drive shaft from the mid-mounted, center ball diff. Next, the front suspension is attached to the transmission case, and the whole thing is mounted on the chassis tub. Take extra care here, because the tranny case snaps into place. If you don't put it in straight, you could split the sides of the tub.

Finally, install the radio, the steering servo and the speed-control servo, and then finish the body. Tamiya has designed a radio tray that holds the speed control and servos firmly. They're well placed, but they seem to concentrate the weight to the far left of the car, and the motor is also on that side. However, the battery does balance the chassis, and there were no apparent adverse effects on handling, even on the tortuous curves at our track.

On the negative side: The battery compartment, although easy to access, will only accommodate a 6-cell flat-pack. If you cut a hole that's large enough in the top of the chassis, I suppose you could squeeze in a seventh cell riding piggyback, but Tamiya should have thought of this if they want serious racers to consider this car for anything but stock competitions.

**PERFORMANCE:** The completed model looks clean, aerodynamic and—of course—*fast!* All-

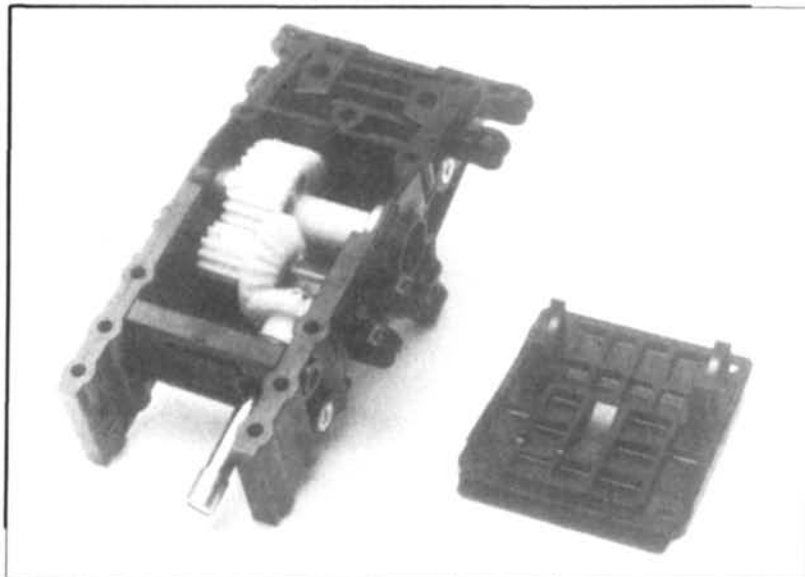


*The front suspension and transmission cases are assembled and ready for installation in the chassis tub.*



though the idea behind racing is having the fastest car, I firmly believe that blinding speed isn't always the way to go. When setting up a new car, my primary goal is to get the car to handle so that I can take any line I want through a turn and come out of it running straight.

The Vanquish handles well right out of the box, but suspension set-up is an important part of getting the best results. I tried several combinations of spring-stiffener spacers before settling on the largest spacers for the rear



The front transmission case shows the planetary gear assembly (top of photo) and bevel gears.

and the smallest for the front. I also experimented with shock oil and found that the 40WT works best all around. With a little front-wheel toe-in, the car went just where I pointed it. The handling was very close to neutral, with a little push where the track was hard.

This car is very easy to drive, and this makes life easier when you're in a pack. Part of the reason for this car's response is probably its Top Gun radio, which seems to be perfect for it. The radio doesn't have dual-rate steering adjustment, but you'll never miss it in the dirt, where just about everyone uses full steering anyway.

After sorting out the handling, I turned my attention to *speed*! Only a few pinions are available for this car, so it's a little difficult to fine-tune your gears for a specific track. The available gears range from 16T to 23T. The 21T gear is supplied with the kit, but the car had higher top speeds down the long straight and punched out of the turns better with the 22T. Even with the stock Tamiya 540 motor, the car stepped along quite nicely.

At the track, a few practice laps against an Avante showed the potential of the Vanquish, which was a little faster out of the turns and at the end of the straight. As a result, the Vanquish increased its lead during each lap. This was actually surprising, since the Avante was dialed-in for this track and sported a Trinity stock motor.

Now, armed with a car in which I have confidence, I can't wait for the first race of the season. With this car, I hope to *vanquish* the competition!

\*Here's the address of the company featured in this article:  
Tamiya/MRC, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

## MRC/TAMIYA VANQUISH

Type ..... 4WD Off-road  
Scale ..... 1/10  
Sug. Retail Price ..... \$354.95

### DIMENSIONS:

Overall Length ..... 17.375 inches  
Width ..... 9.375 inches  
Height ..... 5.5 inches  
Wheelbase ..... 10.75 inches  
Front Track ..... 8 inches  
Rear Track ..... 8 inches

### WEIGHT:

Gross (w/bat.) ..... 3 pounds, 7 ounces

### BODY:

Type ..... Aerodynamic off-road buggy  
Material ..... Polycarbonate

### CHASSIS:

Type ..... Monocoque box  
Material ..... ABS plastic

### DRIVE TRAIN:

Type (pri./sec.) ..... Pinion-spur/drive shaft  
Differentials ..... Central ball/(front-rear) planetary gear  
Bearings/bushings ... Bronze, plastic and ball bearings

### SUSPENSION:

Type (f/r) ..... Wishbone/control arm  
Dampening (f/r) Plastic oil-filled/coil-over shocks

### WHEELS:

Front: Type ..... Plastic one-piece  
Dimensions (DxW) 2x1.125 inches  
Rear: Type ..... Plastic one-piece  
Dimensions (DxW) 2x1.375 inches

### TIRES:

Front/Rear ..... Low-profile pin-spoke

### ELECTRICS:

Motor ..... RS-540S stock  
Battery Req'd ..... 6-cell stick pack  
Speed Controller Three-step forward and reverse

### OPTIONS AS TESTED:

MRC Top Gun radio, ball bearings, Tamiya EX 1700mAh 7.2V battery pack.

### COMMENTS:

The Vanquish is the longer, wider, lighter, less-expensive cousin of the Avante. Many parts for the Avante fit the Vanquish, including aluminum shocks, graphite chassis and cam-lock wheels. The suspension system of the car seems rugged enough, but it still needs about an inch more travel up front.

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## SCOPING OUT

(Continued from page 98)

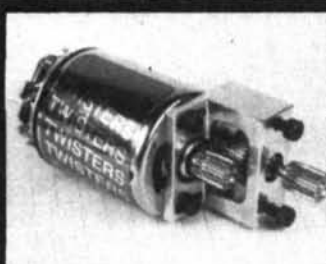
brake circuit's overheating. As it was supposed to, the microcomputer shut everything down long enough to allow proper cooling and then resumed normal operation. The LED on the controller flashes (controller operations aren't affected by

the flashing) to let you know that the interruption of power was a normal thermal shutdown and not the result of a major problem in the controller.

The exciting results of the street test were enough to get my 18-year-old son, Joe, and I heading toward the track. (Joe drives for me.) The track was so dusty that it had very little traction. I set the initial

programming to simulate the action of a non-programmable speed controller. The car ran quite well, but spin-outs were common because of the loose dirt. By programming, I started to soften the acceleration rate, and this seemed to decrease the tendency to spin out. The programming seems to work, and it should

(Continued on page 110)



### 2 TO 1 TRANNY

Gear Reduction Transmission, Fits TRC Pro-10, Eliminator 10, Predator, Villan GP10, Shadow 2 + 2, Viper Outlaw, 2 + 2, Infinity-10, VicFor and others.

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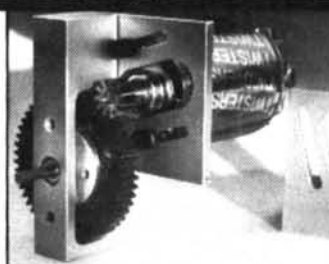
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Kits fit cars named to left. Instructions included, kits can be adapted to other cars with similar parts.



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## SCOPING OUT

(Continued from page 108)

improve your lap times. Anyone who wants to race the Micro Zeta seriously should have a logbook in which to record how the controller responds with particular program settings on a variety of track conditions. This logbook would also be a

good place to store a copy of the program codes, because they're too numerous to memorize.

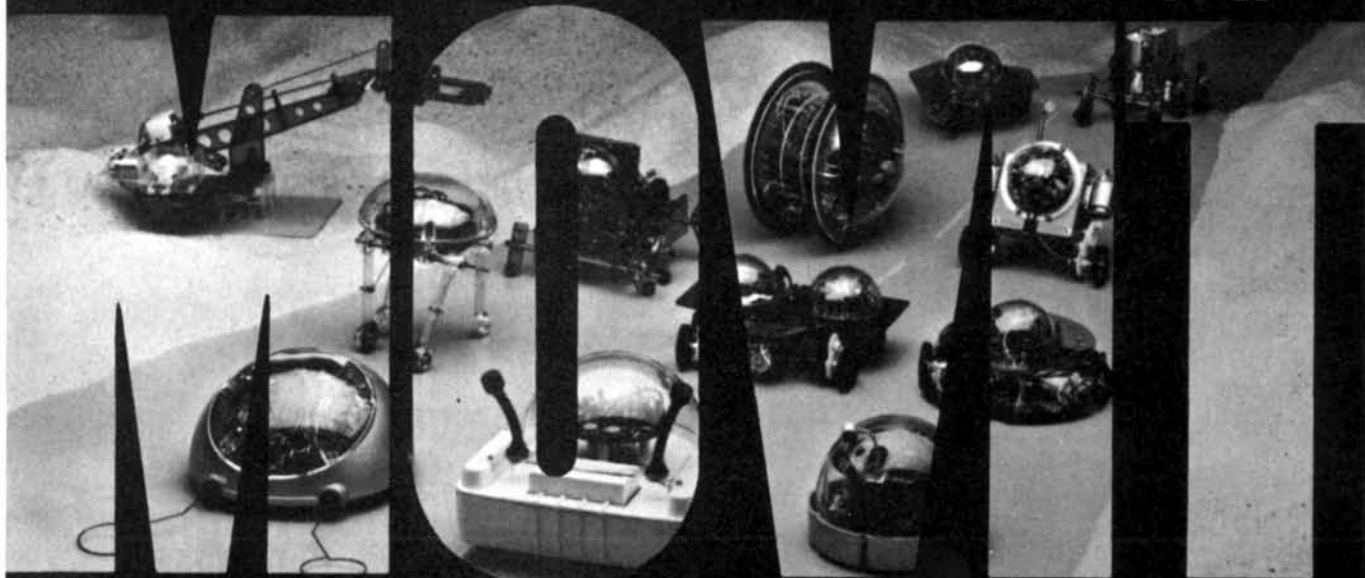
The Drag Zeta did prove itself a worthy contender on a track that didn't require much braking. Those who want to be involved in drag racing *and* oval-track racing could swap this controller between two cars, because it can be reprogrammed

and will act like two completely different controllers.

Because of the Drag model's soft brake, however, a better combination would be one hand-held programmer and two speed controllers: a Drag Zeta and a Pro Zeta. I wonder how my Ultima would run with 20 cells on board!

(Continued on page 112)

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## SCOPING OUT

(Continued from page 110)

Did I like *everything* about this speed controller? Of course not! I didn't like the round hole required to mount the on/off switch, the smallness of the program switches and the need for constant referral to the program chart. But I did like its

low FET "on" resistance, its solid design and construction and, of course, its programmability.

Now to answer my original question: "Expensive, but is it worth it?" The advantages of being programmable coupled with its low "on" resistance make the Drag Micro Zeta well worth its price. PDI always stands behind its products, and

whenever I've contacted them with questions, they've always been helpful. They assure me that anyone who has trouble with or questions about their products will get the same treatment. The Drag Micro Zeta is well-designed and well-built; it's also unique, and, as always, PDI wants to ensure that racers who use it understand

(Continued on page 114)

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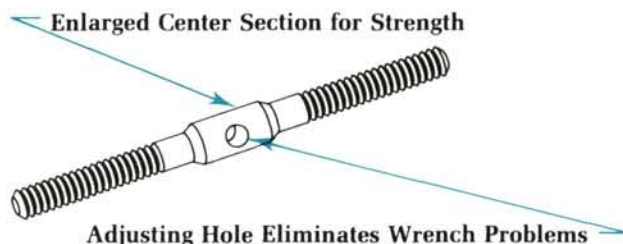
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## SCOPING OUT

(Continued from page 112)

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\*Here's the address of the company featured in this article:

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## DIRT DIGEST

(Continued from page 85)

able to move each pound of vehicle. The higher the number, the greater the power that's available to move each pound of car and, therefore, the faster the car can go. Let's take two examples:

A popular car today is the Kyosho Stinger Mk. II. The Stinger buggy is probably the pre-eminent 1/10-scale 4WD off-road car when equipped with an O.S. CZ-R engine. Let's compare this with, say, the Callaway Twin Turbo Corvette Sport. Table 3 lists the vital specifications of the two cars:

Table 3

	Horse-power	Weight (pounds)	P/W Ratio
Stinger Mk. II	.43	3.6	.119
Callaway Corvette	400	3403	.118

Look at that! The Stinger has a higher power-to-weight ratio than the Corvette. Not only that, but you can pick up the Stinger with engine and radio for about \$450. Compare that with the Corvette, which costs \$83,550 more. And don't even think of getting insurance on the 'Vette. If you're unmarried and under 25, insurance would probably cost you \$450 a day! The Stinger Mk. II. What a deal!

The point of all this is to show how serious the performance level of gas-powered R/C vehicles is. This is partly the result of the fuel used in many of them. Unlike full-size engines, most R/C engines use a fuel containing methanol combined with nitro and lubricant. Methanol is wood alcohol, which is highly poisonous, but an excellent, clean-burning fuel. The nitro adds a little extra kick for that added power edge, while the lubricant provides the lubrication that's necessary to keep the engine from grinding itself to pieces as the piston goes up and down. You'll find a tremendous variety of fuels out there, the differences being primarily in their nitro contents. Fuel

(Continued on page 116)

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Airtronics A&L Andy's Aristo-Craft Ascot Associated Astro Flight Autographics Big Boy Toys Bolink Blue Ribbon Bud's Checkpoint Cheetah Cichon C&M CMW Cobra CRP Composite Craft Delta Dahm's Dubro Fine Design Gonzo Great Grease Houge Hot Trick JG Kimbrough KO Propo Lightspeed Litespeed Losi M&M McAllister MIP MRC MRP NMB Novak Pactra Paragon Parma Peak performance Pitstop Power Pak ProLine Procut Pro Shop Protech	Protrack Ram Raceco Race Master Race Prep Racing Silks RCH R/C Performance Spec Revtech Rockbusters Rochester Rcw Robinson Racing Sermos Solder-it SRS Tekin Thorp TM Traxxas TRC Trinity Twinn-K Twister Victor Zeta	<b>NEW COMPANIES:</b> Advanced x2 Bondus Dan's Dialed Edge Hyperdrive Imex KRP KSC Lazerlite Max Industries MCS Morgan Norcal Performance Plus Progressive Technologies RC Car Repair Shadow Master Shinwa Speedworks S.T. (skis) T&A Team Hammer TMS TrackMaster UE  <b>AND NEWER:</b> J-Car WSS inc. RPM Miracle Speedway Bruline B&R Stagell
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## DIRT DIGEST

(Continued from page 114)

might have no nitro or up to 50 percent nitro. For most R/C car applications, however, a 5- or 10-percent mixture is more than enough for your engine without putting too much stress on it and wearing it out prematurely. While on the

subject of wear, fuel might contain either castor oil or synthetic lubricants. I highly recommend that you stick to the castor-oil formula, as it carries heat away more efficiently than synthetics, and it withstands overheating better, too.

Anyway, that's it from me for this month. I'm pleased I could muscle my way in front of the computer long enough

to write about something I like for a change. Who knows? Maybe Bill will like this column so much that we can develop one of these ideas even further next month. Better yet, you might even like the idea of gas so much that you'll write in and ask us to talk about gas cars—in which case, Bill *won't* have a choice, so WRITE!

# TMS pröducts



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# PRO-LINE RC10 MONSTER TRUCK CONVERSION

by BILL O'BRIEN



## MONSTER IN A BOX

**J**UST WHEN YOU thought it was safe to go back to the track; just when you thought you'd seen every on-road, sprint, oval or truck conversion for the RC10—here comes another one. Pro-Line\* (yes, the wheel-and-tire people) has unleashed its interpretation of the RC10 monster truck. And if you're wondering how they could possibly know anything about the topic, be advised that its \$79 kit is one of the most complete conversion packages I've yet to see.

Everyone gives you chassis uprights and mounting posts that stick your truck body up high in the air; some will sell you a body to cap your renovated monster-truck chassis; a few kits include wheels and tires. Pro-Line throws *all* of that into a box, and if you have a working RC10 to begin with, your truck can be up and crushing in about an hour. Actually, the only things not included are decals and a front bumper.

**ASSEMBLY:** There isn't very much

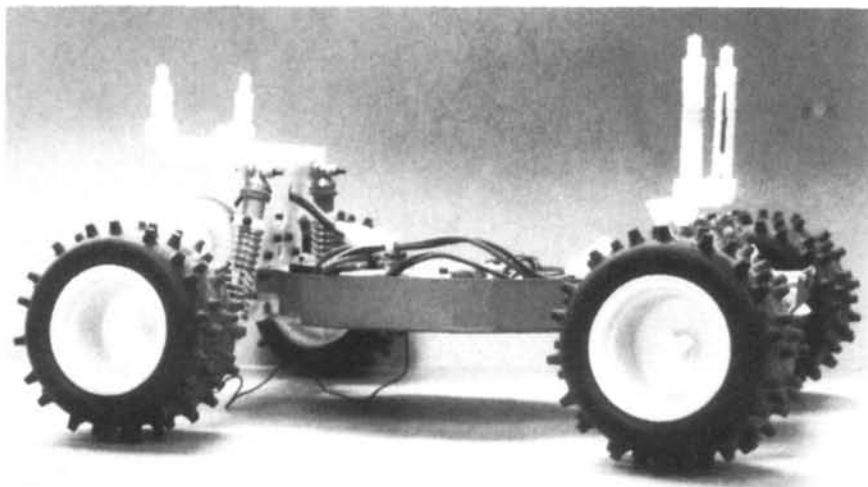
to do with this kit. Disassemble the front and rear shocks from their towers; attach the extended body supports with the longer screws that Pro-Line supplies; bolt on the mounting posts; re-attach the shocks; and you're three-quarters done. The instructions are clear, and the illustrations are quality mechanical drawings, not hand-etchings that you might find in a 2nd-grade art class.

One drawback is that Pro-Line makes no suggestion as to what size the body

posts should be. They start out quite long (about 3.5 inches) and, installed at their original length, your truck will look silly with the body sitting up in the breeze—as well as uneven, because the front chassis extension sits lower than the rear.

To compensate for the different

for running the truck. (Besides, if you want to switch between truck and dirt racer, it's easier to switch steering-block assemblies than axles and, done that way, the full transformation should take about 20 minutes in the field, rather than an hour back at the shop at a vise and a table.)



*The completed chassis is ready for whichever body you choose; Pro-Line includes a Chevy Stadium Racer. This conversion retains RC10 handling qualities.*

heights of the chassis extensions, I cut mine down to 3 inches in the front and 1 1/2 inches at the rear. The result is that the front wheels will touch the body if they're fully compressed into the shocks, but the appearance of the truck is much more realistic.

Pro-Line doesn't compromise on the wheels: They're large and wide. And while Pro-Line has offset the mounting plate on the rear wheels so you can use the original axles, it wasn't so kind with the front wheels. Instead, you're given a pair of longer front axles to replace your originals. The tough part of this conversion is the front axles.

Anyone who has assembled an RC10 knows that the stock axles are press-fit into the steering arms, and you just don't push them in with your fingers, unless you're the size of Hulk Hogan. Mere mortals use a vise because it's a tight fit. Getting them out again is not a job to sneeze at, especially if you've had the car for a while. Pro-Line recommends that you whack the back of the axles with a hammer and a soft iron rod while supporting the steering arm on the edge of a table. I think you should buy a spare pair of steering arms and save the extra energy

Luckily, I had just given in to RC10 mania (I have four other 2WD cars and had refused to buy an RC10 just on principle) and purchased a basic kit. Sometimes, starting with fresh components is the only way to go.

Once the axles are in place (the replacements are just as difficult to install as the originals), you can slip the front wheels on. Pro-Line supplies nylon bushings for them, but they'll also take standard Tamiya\* large bearings. Spinners that are larger, but the same style as the stock RC10 units, hold the wheels on both the front and rear axles.

All that remains is for you to trim off the unwanted Lexan, paint the Chevy Stadium Truck body, mount it to the body posts and secure it in place with the clips, which are also supplied.

When you set it down and stand back to look at your finished truck conversion, don't be startled to see that the larger wheels and tires emphasize any toe-in on the front or rear wheels. It might look a little too radical at first, but that larger rolling stock needs some toe-in to keep a reasonable turning radius. If you've set up your RC10 according to the standard instructions, you might have to adjust the

## PRO-LINE

### RC10 MONSTER TRUCK CONVERSION

Suggested Retail .....	\$79.00
Running Gear .....	RC10 (not incl.)
Wheel Diameter .....	2 inches
Tires (D/W) .....	4-inch (spike to spike) 2-inch
Ground Clearance .....	2.75 inches
Vehicle Height .....	9.5 inches (adjustable)
Length .....	16.25 inches
Weight .....	3.75 pounds with 6-cell battery and radio gear.

Kit includes: Chassis extensions, body mounting posts and retainers; four wheels and spiked tires with front nylon bushings; extended front axles; unpainted Lexan Chevy Stadium Racer body.

#### COMMENTS:

The Pro-Line conversion for the RC10 is one of the most complete kits I've seen, lacking only a front bumper. The mechanical assembly should take no more than an hour, and the most difficult phase is removing the stock axles and replacing them with the extended units contained in the kit. The documentation is well-done, but it fails to note the correct installed height of the body-mounting posts.

camber on the front wheels. The larger wheels distort the standard camber angle, which was too steep for me.

**PERFORMANCE:** The local track is dusty, but since it's a hard surface, I had to trim back the spikes on the Pro-Line tires. This conversion is odd. As a monster truck, the RC10 doesn't have the rip or roar of my converted 4WD Optima Mid or the high-flying antics of my Wildebeest.

When I dumped the throttle, the truck took off at a run. There was no jump, no raised front wheels, just forward motion (a smaller-than-stock pinion gear or larger spur gear is probably in order, but I had left those accessories in my other suit). Hard cornering brought the truck to the verge of bicycling through a narrow 20-inch turning radius, but recovering was no more difficult than easing off the throttle.

During a half hour of blasting through the dirt, there were absolutely no surprises. It's one of the few times I've been bothered by the fact that an R/C vehicle was acting in a stable, predictable man-

*(Continued on page 151)*



# The ultimate off-road R/C vehicle!

SECOND  
LOOK  
SERIES

by MIKE LEE

**O**FF-ROAD RACING! It's fun; it's exciting; and it's highly competitive. The fastest-growing aspect of R/C, off-road racing offers non-stop enjoyment for people of all ages, and it's also the toughest test for new cars. This Track Report deals with the Associated\* RC10 off-road car, which is solidly built and designed to be easily adapted to any track.

**THE KIT:** My RC10 is the deluxe kit that includes the car, the motor, a 6-cell battery, a charge cord, ball bearings and a full body kit. Everything except the radio is provided. The instruction manual is the best I've ever seen for any car kit; it's clearly written and outlines easy assembly steps. There's even an illustrated manual.

**CONSTRUCTION:** Assembly begins with the front-end components and the main pan, which is a one-piece monocoque aluminum chassis, anodized in a striking gold. All the parts attached to the pan are secured with tempered hardware that's countersunk into the pan, so the result is a flat-bottom chassis with nothing that could be torn off.

The front end features fully articulated movement with independent suspension. The moving parts are hinged with hardened pins held in place with circlips, and this arrangement gives very smooth movement of the front suspension arms. The camber, toe-in and toe-out are controlled by threaded tie rods that are attached with ball joints. Front-end adjustments are easy to make and can be very precise.

Steering is handled by not one, but two Associated servo-saver tiller arms, so every bump and shock can be absorbed separately by each wheel, rather than by the whole front end. The front shock absorbers are a new Associated design; they have hardened, drill-blank shafts with double-end seals and machined-aluminum bodies.

Moving to the rear end, you'll again find a fully articulated A-arm-type suspension, and, like the front end, the rear is easily adjusted for travel and camber.

The transmission is the heart the RC10. Not unlike its road-racing cousins, the RC10 uses Associated's Vari-Diff ball differential, which can be set to render a wide-ranging control on the rear wheels, including a full lock. The differential makes its contribution to the rear wheels via four spur-toothed gears, the last of which provides the motivation. Care has been taken here, as the axle drive gear is sealed with a felt dust cover that protects the transmission.

The wheels have separate dogbone-type axles, which make universal joints unnecessary. The rear wheels have high knobby tires mounted on heavy-duty nylon wheels, and Associated has thoughtfully thrown in axle adapters to allow the use of other brands of wheels. The front tires are narrow ribbed tires, again mounted on heavy-duty nylon wheels.





ASSOCIATED ELECTRICS

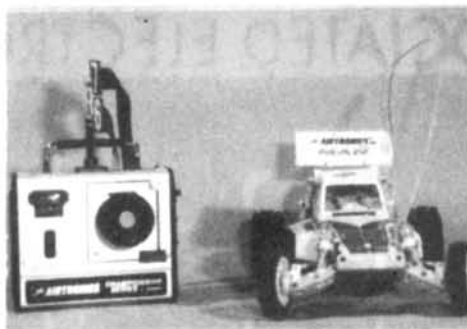
# RC 10



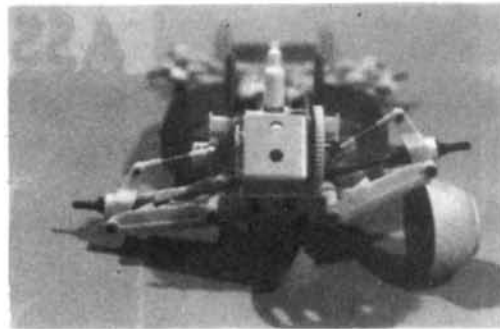
PHOTO BY LOUIS V. DEFRANCESCO, JR.



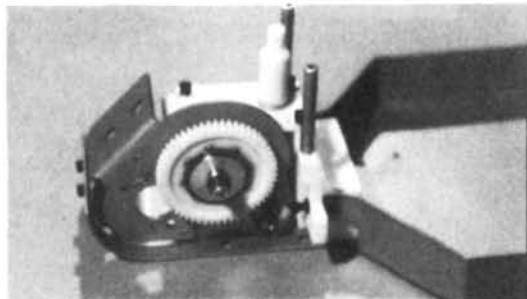
# RC 10



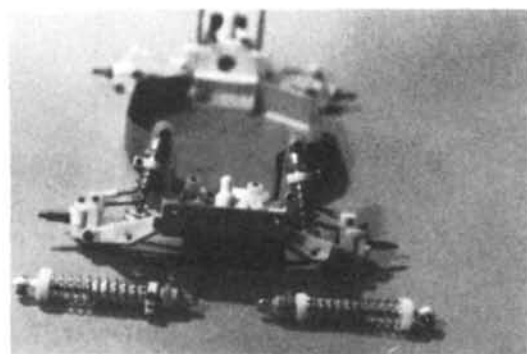
*Associated's off-road RC10 combines good looks and high performance; Airtronics controls are shown.*



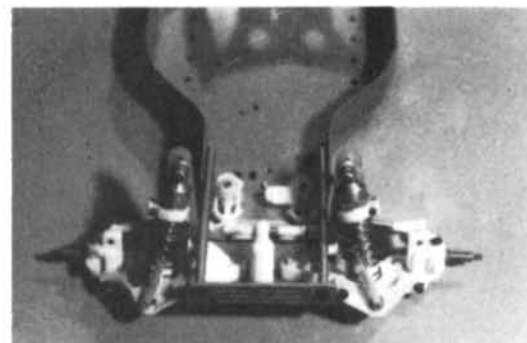
*The long suspension travel of the RC10's rear end is evident in the photo.*



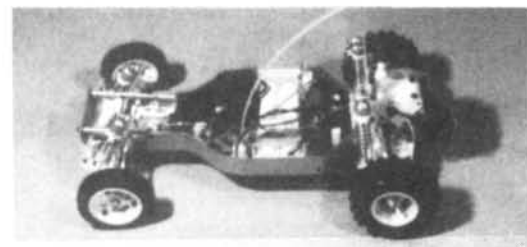
*Drive train is a relatively simple, but effective, design and provides performance plus.*



*Independent suspension is featured both front and rear on the RC10.*



*Suspension is dampened by oil-filled, coil-over shocks and is fully adjustable.*



*Completed car without the body. Radio components and batteries are well-protected by*

As far as the business end of the car goes, the RC10 is furnished with an Associated Yokomo off-road, stock, 05 motor, which has everything legally allowed under the present ROAR off-road rules for stock-class vehicles. It has a modular end bell, shunted brushes, re-magnetized magnets, and all the other speed features you always wanted to have.

I used the CSW-3 wheel radio from Airtronics\*, and it features dual-rate steering, reversing on all three functions, end-point adjustment, exponential servo rates and total throw adjust on the throttle. Added to this is discrete servo actuation, and this means you can operate the whole system without transmitting a signal. Even more exciting is that you can check the receiver battery from the transmitter, and there's also front facing and exposed dual-rate adjustment, quick-change frequency modules and clean FM modulation.

It's easy to handle the Airtronics car radio: Cradling the transmitter in your left arm, you work the throttle with your left hand and the steering with your right. (The steering wheel has a nice foam cover.) The CSW-3's receiver is a double-tuned miniature receiver with plug-in crystals for fast frequency changes, lightness and great range. The Championship CSW-3 has the standard 94394 servos, which provide over 45 inch/ounces of torque output, a splined output shaft, a carbon wiper and pot assemblies for accuracy, and very rugged construction. This Airtronics radio also fits perfectly.

The RC10 has servo-mounting holes that are designed to allow at least six brands of servos to be fitted; these range from standard size to sub-miniatures. This shows unusual forethought on the part of the manufacturer. With the chassis complete, I only had to paint and mount the body. The Associated RC10 comes with a Lexan plastic Funco-type body. You'd better believe this body will last, because it's *thick*! It isn't a brick, mind you, but it will take some time to wear *this* one out. I used acrylic enamel for the tinting, and I dressed it up with the kit-supplied sponsor stickers.

**PERFORMANCE:** Compared with my other dirt burners, the RC10 is faster, but speed isn't everything. Without suspension tuning, it handles very well right from the bench. The tires provide solid bite, and the car doesn't show any signs of severe rolling (probably because it has an anti-roll sway bar on the front).

# RC10 UPDATE

by STEVE POND

**L**OOKING BACK AT THE history of the automobile, certain cars come to mind as being revolutionary—the first of a kind; the fastest; the sleekest; the most powerful, etc. Whatever their attributes, they're memorable as "pioneers."

The Associated RC10 is the high-performance pioneer of the R/C car industry, and its introduction in '84 brought the R/C world into the "performance age." When the car first hit the scene, successful racers included the Cox Scorpion and the Tamiya Super Champ. On the track, the new RC10 dealt a lethal blow to these cars, and it has never looked back. Nothing before it had such a radically new design that it could leave the competition in the dust. In fact, the RC10 was so far ahead that no other car was able to threaten its claim to the throne for quite some time.

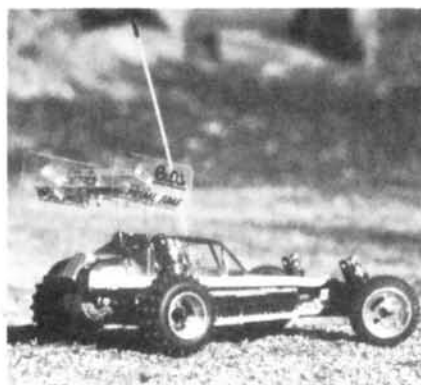
Even today, the RC10 still has a strong foothold in the market, and its list of victories eclipses that of any other car. While some cars are now occasionally able to get the better of the RC10, it's still able to hold its ground; it just has to *share* the spotlight!

The RC10's immense popularity was a direct result not only of its high performance levels, but also the easy availability of replacement and high-performance parts for it. Just about every after-market parts manufacturer made something to "improve" its already superb performance. There are also conversion kits that enable you to transform the RC10 into a monster truck, an oval racer, a carpet racer, a sprint car, a supermodified, 4WD off-roader, and even a gas-powered off-roader.

Even though it's easy to assemble and its out-of-the-box performance is commendable, improvements to obtain maximum performance can still be made. *Radio Control Car Action* has featured many articles about methods of enhancing the RC10's handling and overall performance, and it continues to be a leader in the 2WD field. Now, with the introduction of the new RC10 Graphite from Team Associated, you can bet that this radical R/C racer will be around for a very long time. ■

Most of us like to see how cars jump, and the RC10, with only moderate wing deflection and mid-ship placement of the battery pack, seems to welcome them. It sails slightly nose-high and lands firmly on its rear wheels. The dampening provided by the shocks is much appreciated here, and the RC10 didn't bounce back up and lose traction. It even seems to cope well with those sharp hops that cause the nose to fall first.

The RC10 is solidly built, designed to last and performs like greased lightning; and the Airtronics CSW-3 Championship Series radio complements it by providing a solid radio link with precise, comfortable control. I highly recommend this combination; together, they make a potent racing team that requires only a willing driver to bring it to the winners' circle.



Take one for a test drive; it's awesome!

*\*Here are the addresses of the companies mentioned in this article:*  
**Associated Electrics**, 3585 Cadillac Ave., Costa Mesa, 92626.  
**Airtronics Inc.**, 11 Autry, Irvine, CA 92718.

## ASSOCIATED

### RC10

Type ..... Off-road racer  
 Scale ..... 1/10  
 Sug. Retail Price ..... \$290

#### DIMENSIONS:

Overall Length ..... 15.125 inches  
 Width ..... 9.125 inches  
 Height ..... 6.0 inches  
 Wheelbase ..... 10.5 inches  
 Track (f/r) ..... 7.75 inches

#### WEIGHT:

Gross (w/bat.) ..... 54 ounces

#### BODY:

Type ..... Single-seat buggy  
 Material ..... Polycarbonate

#### CHASSIS:

Type ..... Tub  
 Material ..... Aluminum

#### DRIVE TRAIN:

Type (pri./sec.) ..... Pinion-spur/geared  
 Differential ..... Ball  
 Bearings/bushings ..... Ball bearings

#### SUSPENSION:

Type (f/r) ..... Lower A-arm, upper link  
 Dampening (f/r) ..... Coil-over,  
 oil-filled shocks

#### WHEELS:

Front: Type ..... 3-piece nylon  
 Dimensions (DxW) ..... 1.875x.675  
 inches  
 Rear: Type ..... 3-piece nylon  
 Dimensions (DxW) ..... 1.6x1.25  
 inches

#### TIRES:

Front ..... Ribbed  
 Rear ..... Spikes

#### ELECTRICS:

Motor ..... Associated Stock 05  
 Battery Req'd ..... 6-cell stick pack  
 Speed Controller ..... Wound rheostat

#### OPTIONS AS TESTED:

Airtronics CSW-3 radio system

#### COMMENTS:

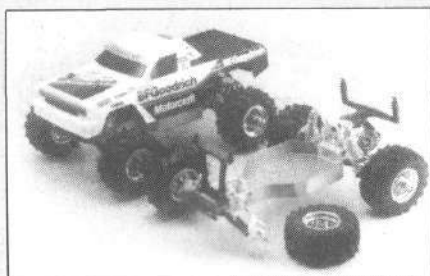
Associated's long-awaited off-road racer is a complete package. The instructions are very complete, and the car is easy to build. Best of all, the car's suspension system really hooks up in the dirt. The RC10 has become the class of the off-road field.

(Continued on page 124)

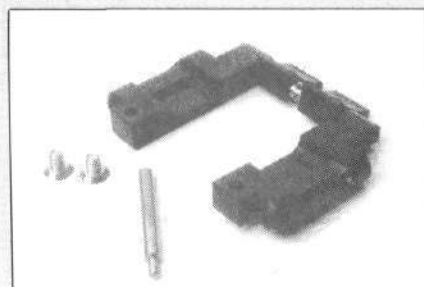


# SECOND-LOOK SERIES BUYER'S GUIDE

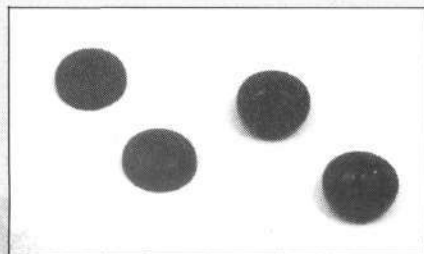
HERE ARE SOME of the many accessories that are now available for the Associated RC10—a car that's not only the most likely candidate for performance-enhancing after-market accessories, but also remains one of the stoutest out-of-the-box performers. Although R/C technology has now produced some strong—even superior—competitors for the RC10, we're sure that the car will be a force to be reckoned with for quite some time.



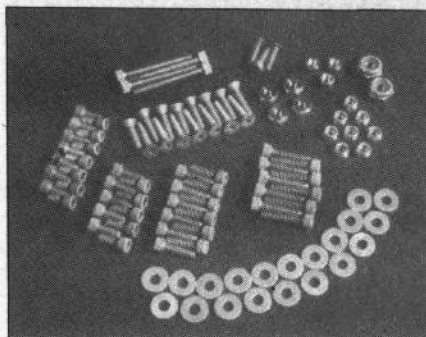
Andy's R/C Monster Truck Conversion is just one of the many conversion kits available for the RC10. It's unique in that it offers just about everything other kits include, plus a set of Andy's suspension arms, which have been proven effective because they widen the front suspension and provide a more stable footing.



The new Tracker kits from Robinson Racing include a unit designed for the RC10. With the Tracker kit, you can adjust the amount of toe-in for the rear end to suit track conditions.



To improve the action of the stock Associated shock absorbers, CRP offers these Shock Pressure Gaskets. By installing these gaskets in the caps of the RC10 shocks, the air space that's required to compensate for the volume of oil that's displaced as the shock is compressed is kept apart from the oil itself, and this prevents bubbles from forming in the oil. This will give you smoother, more consistent dampening.



To help you shed some weight, Team Pit Stop offers this lightweight hardware kit that includes aluminum fasteners to replace the heavier steel ones that come with the RC10 kit. Results will vary according to how much of the hardware you use, but you can lose up to 2.5 ounces.



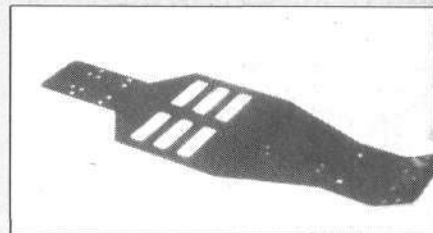
To replace the RC10's stock rod ends, which are infamous for popping off the clutch as they get old and worn, or simply to replace the stock linkage rods, which sometimes bend, Trinity offers a heavy-duty steering kit. This kit includes ultra-strong heim joints, a high-quality 4-40 threaded rod and all the necessary fastening hardware.



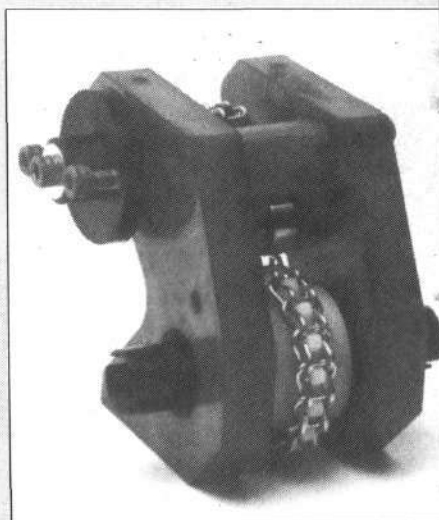
To replace the RC10 shocks' spring clamps, CRP offers these strong nylon spring clamps. If you strip your stock clamps by over-tightening, or simply just break them, these CRP clamps are strong alternatives.



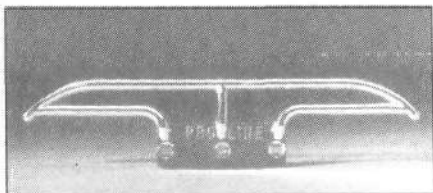
To help the output gears in the stock Associated transmission, Parma offers these Teflon-sealed bearings. Designed to replace the felt seal and retainer, they help reduce friction and drag, and they reduce premature idler-gear wear.



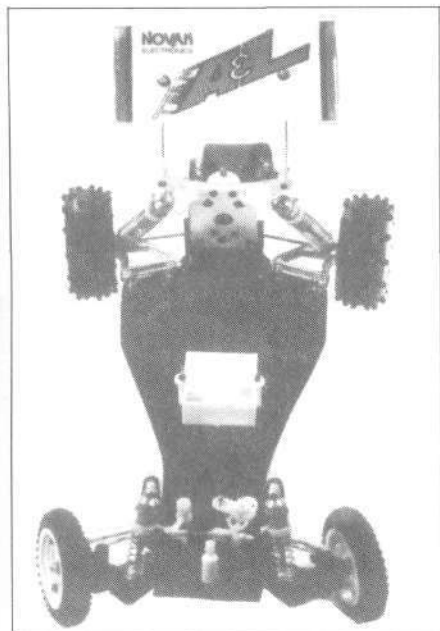
To help you lower the RC10's center of gravity and also reduce its weight, CompositeCraft offers this saddle-pack chassis. Made of strong carbon-fiber composite, this chassis is considerably lighter than the stock RC10 chassis, and it also includes battery slots that allow you to use saddle-type batteries.



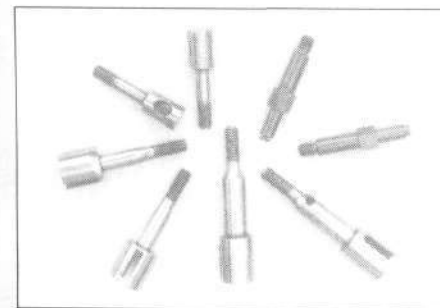
As an alternative to the stock Associated transmission, which requires a lot of work to make it suitable for the highest levels of competition, Team Pit Stop offers this chain-drive transmission. It has a central, adjustable differential that resists dirt, a strong chain drive, and a ball-bearing idler to keep the chain tight and minimize friction.



While the RC10 hasn't shown any inherent weakness in its front end, it's a good idea to protect it from those unexpected high-speed crashes. Pro-Line offers these chrome bumpers that bolt directly, without modification, onto the RC10.

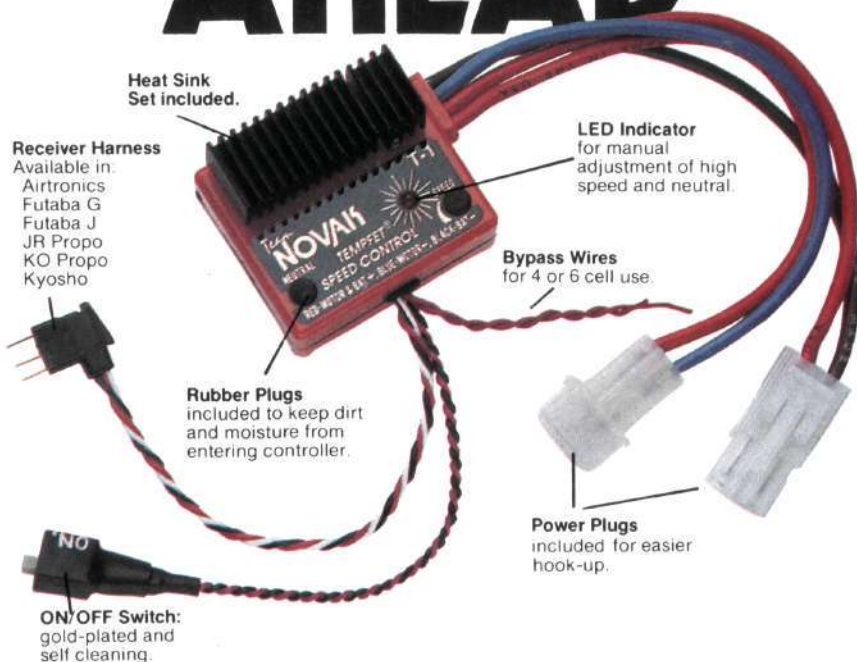


To convert your RC10 to trailing-arm rear suspension, Allec&Lane offers this complete conversion kit, which includes a graphite chassis designed for use with the A&L trailing arms. To tailor the car's handling to suit track conditions, this race-proven combination allows you to adjust the rear toe-in from 1 to 5 degrees.



Technacraft now offers these ultra-strong, lightweight titanium axles and drive cups for the Associated RC10. These parts are machined to very exact tolerances, and this ensures a good fit. You can also be confident that the titanium construction won't fail!

# FULL SPEED AHEAD



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Specifications	T4	T1	T1X
Weight with Wires (oz.)	1.74	1.74	2.46
Voltage Drop (V/A)	0.0045	0.0030	0.0015
Continuous Current (A)	176	276	576
Voltage Input (cells)	4-10	4-10	4-10
Braking Power (A)	26	26	52
Response (msec)	15-20	15-20	15-20
Current Efficiency	99%+	99%+	99%+
Motor & Battery Plugs	yes	yes	no

Team

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## TWISTER

(Continued from page 52)

came out of the corner in front and then turned the speed on. Anderson was involved in another crash on turn five, and this eliminated any chance he had to catch up. With just over 1 minute to go, his smooth turns and consistent jumps enabled Moore to increase his lead and win easily with 13 laps in 4:02.30. He drove an Associated RC10 with a Reedy Modified motor.

Here are the A-Main winners in each class:

- 2WD Stock: Jon Anderson
- 4WD Stock: Bobby Drummond
- 2WD Modified: Eustice Moore Jr.
- 4WD Modified: Jay Kanemoto

Before leaving, Mike Walker told us that the Hobby Haven Raceway is "one of the best" tracks his team has raced on, and Eustice Moore Jr. gave the track a maximum rating of "10." The Hobby Haven Raceway has been open for less than a year, but it has already been the site of two major events. The owners hope to continue to provide top-caliber, indoor, off-road racing that will attract the biggest names in R/C racing. While the first

annual Twister Challenge is history, keep your ears open for the second one. ■

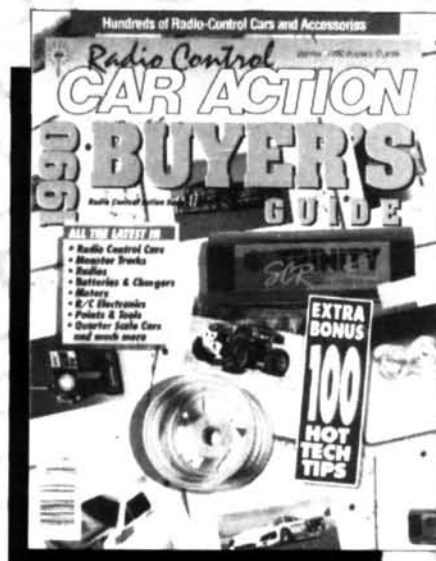
## ELIMINATOR

(Continued from page 94)

BoLINK's MAX-TRAK on the rears to increase bite without going to a softer tire that could cause the car to hop. (This is usually caused by the rear roll being too loose, or having tires that get enough traction to cause the car to lift up on the inside, lose traction, and then bite again.)

(Continued on page 128)

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## ELIMINATOR

(Continued from page 126)

If your front tires are too soft, their bite will cause the car to spin out a lot, and you won't be able to correct this with chassis adjustments. You'll have to put a harder-compound tire on the front or try adding traction additive to the rears first.

**PERFORMANCE:** With the Eliminator Sport ready to go, the test track was the next stop. The Sport was run at R.C. World, which is a new high-banked tri-oval facility in Danbury, CT (a first for the area). From the starting line, the Sport soon reached speed using power from its BoLINK stock motor and kit-provided 12/48 gear combination. Beginners should find its top speed ample and controllable, and I think that it's among beginners that this car will make its first big impression.

After going through turn one (the top of the tri-oval) at full throttle, the Sport quickly reached turn two and I didn't have to back down on the throttle. Out of turn three and onto the 120-foot back stretch, but the Sport climbed up on turn four, which is a relatively tight high-banked turn. This is where one of BoLINK's handling tips were useful. Regardless of the speed at which the Sport took this turn, its rear end was always drifting to the wall and it spun out several times. After referring back to BoLINK's recommendations, hoping to solve the problem, I treated the rear tires with tire additive.

With the additive, the rear traction was much better going through turns four and five, but acceleration was still hampered by the front bite, which was still more than the rears could keep up with. The last modification was the winner: To decrease front bite, I changed the front tires to the orange dot, extra-firm compound.

After this, the Eliminator Sport could cover the R.C. World tri-oval competently, and it handled well enough to give the best a run for their big bucks. The out-of-the-box car impressed everyone—even with its resistor-type speed controller and oilite bronze bushings. To take its performance one step further, the oilite bronze bushings were replaced with ball bearings: four for the front wheels and two for the rear axle. In addition to the bearing change, the speed control was replaced with a Pro Micro Zeta speed control from PDI\*. The performance difference was remarkable. Not only did the car accelerate faster and harder (which I attribute to the bearings and the speed control's response), but the Sport could also enter turns much faster and deeper without its brakes locking up and so losing you

(Continued on page 130)

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## ELIMINATOR

(Continued from page 128)

time or causing a spin-out. This improvement was a result of the Pro Micro's programmable braking function, with which a 50-percent braking maximum was set. Lap times were increased by more than 1 second, so the Eliminator Sport gave a few modified racers some hard competition, and that was with a *stock* motor. What if a modified motor is added? I think BoLINK could be on to something that will turn some heads.

\*Here are the addresses of the companies mentioned in this article:

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

PDI, 16922 N.E. 124th St., Redmond, WA 98052.

## BUDGET RACER

(Continued from page 97)

could run the high line or the low line at full throttle anywhere on the track. I tried it on an outdoor sandy track, too, and the results were the same. When the car reached about half speed, the wing and vertical stabs started working and the car ran as if it were on rails.

There's still the "push" problem, though. Since I changed to the pin-spoke tires, however, it has improved, and now, with the stable rear end, it's within handling limits. In addition, many adjustments can be made to reduce this tendency.

Now I'm sure the Maxxum FF can be made competitive on the dirt oval in the 4WD stock class, but since Kyosho didn't discover the need for a big wing, I wonder just how much testing did they do with this car before releasing it?

Next month, I'll have dirt-oval race results with the Maxxum FF, a lot more tuning tips, and I'll see if I can get the folks at Sacramento MiniWheels to let me run the Maxxum in the Sprint Stock Class. A FWD sprinter!?! You heard it here first!

See you at the track.

\*Here are the addresses of the companies mentioned in this article:

Kyosho, distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

Associated Electronics, 3585 Cadillac Ave., Costa Mesa, CA 92626.

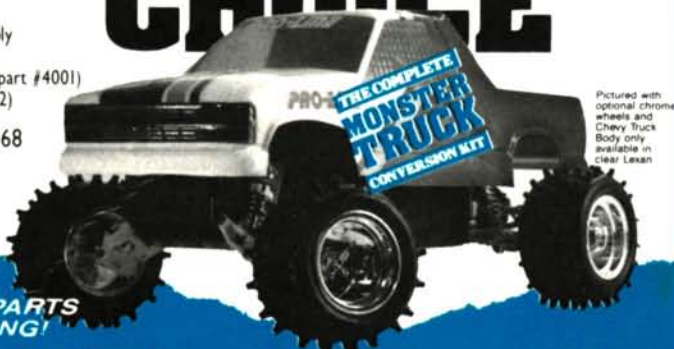
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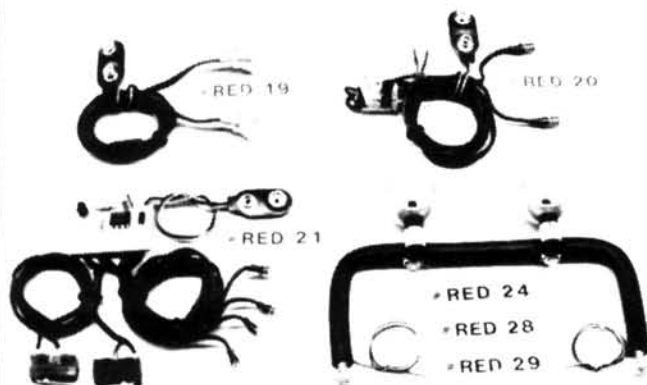
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## DIRT OVAL NATS

(Continued from page 82)

lap lead over Lett and the rest of the field. Win (a perfect name for a racer!) was taken out by a back marker, and then one of his front tires came partially off its rim, and he finished in 7th place. Because of Carter's misfortune, Lett was able to make up the half-lap deficit to take the lead. Starting 5th, Knoles took his Twister-powered Scorpion all the way to 2nd, but keeping ahead of him by making great use

of traffic, Lett won by  $\frac{3}{10}$  second. Had the race been a few laps longer, Knoles might have won. Martin Buchanan came from the 8th spot to put his Revtech-powered RC10 in the money by finishing 3rd, a lap down.

The 4WD Modified Class races are always very exciting, and this time, there was as much excitement off the track, after the race, as there was during the race itself!

Coming out of 5th place on the grid, Erik Soderquist, of San Diego, CA, got a

tremendous holeshot that propelled his Twister-powered Dominator to the front of the pack, and Brian Landgraff, driving a Revtech-powered Dominator, followed him to the front from his 6th starting spot. Pole-sitter Warren Darby settled into 3rd place. Landgraff and Darby traded positions a number of times, but Landgraff eventually took control of 2nd place. Early in the race, Soderquist had the advantage when Landgraff and Darby were battling for position. His earlier lap times

(Continued on page 144)

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# WHAT'S NEW



## PARMA '88 CHEVY BERETTA

Parma's newest 1/10-scale body is the '88 Chevy Beretta. This high-quality, beautifully detailed body is modeled after the car that's now competing in IMSA GTU competition. Using a Parma No. 10453 Body Mounting Kit, it fits most 1/10-scale chassis.

For more information, contact Parma, 13927 Progress Pkwy., North Royalton, OH 44133.



## WORLD ENGINES PRO-CHARGE

Introducing the new Pro-Charge battery charger from World Engines Inc. It features: one full-time trickle output; one trickle/fast-charge/discharge output; a timed discharge; automatic trickle-charge after discharging; a strong vinyl-clad aluminum case; power-input and -output indicator lights; 6- to 10-cell charging capacity; voltmeter-lead connection jacks; fuse-protected output for protection from polarity reversing and shorting; and it will accept 110VAC or 12VDC power input. The Pro-Charge charger also carries a 5-year limited warranty.

Part No. 10155 (1020 AC/DC charger). Price: \$104.95.

For more information, contact World Engines, Inc., 8960 Rossash Ave., Cincinnati, OH 45236.



## COX HOBBIES PISTOL-GRIP RADIO

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For more information, contact Cox Hobbies, Inc., 1525 E. Warner Ave., Santa Ana, CA 92705.



## TWINN-K GEAR PULLER & BODY GROMMETS

The R/C Gear Puller is a handy tool with which to remove a pinion from an armature, and it's ideal when the setscrew

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The Twinn-K Body Mounting Grommets protect R/C car bodies and fit Parma, BoLINK and Associated body mounts.

For more information, contact Twinn-K, P.O. Box 31228, Indianapolis, IN 46231.



## ASSOCIATED RC10 GRAPHITE

Associated's new RC10 Graphite competition 2WD car will be available in two versions: one with oil-impregnated bronze bushings and one with precision ball bearings. The RC10 Graphite isn't designed to replace the RC10, but is a competition version of it! The RC10 Graphite includes: a lightweight, durable, graphite chassis; Associated's new TQ tires and wheels (for maximum traction); the aerodynamic Protech II Lexan single-seater body; longer front A-arms to widen the front end for increased stability through the turns; a re-designed front shock tower providing more adjustments; in-line front axle and steering blocks to quicken steering response (give better cornering—Part No. 6217 and 6218); 3 degrees rear toe-in for added stability; universal-joint rear stub axle; rear bulkhead with improved geometry; stronger black idler gears (Part No. 6614); and turnbuckle tie rods for quick, easy adjustment. No motor or electrical items are included, so you can add the equipment you prefer. An electronic speed control is recommended:

Part No. 6025 (without ball bearings). Price: \$250. Part No. 6030 (with ball bearings). Price: \$325.

For more information, contact Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.

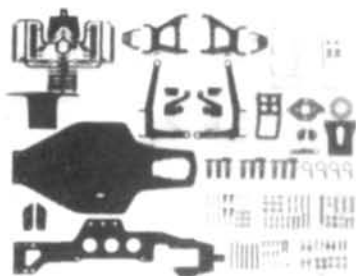
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### **WCM PRO-STOCK DRAG CAR**

WCM Corp. introduces its latest car: the Hole Shot. On March 1, the company started shipping this powerful Drag Car, which had been in the development stages for some time. This high-quality kit Drag Car comes with a two-speed transmission with a 35cc 2-stroke engine.

For more information, contact WCM Corp., Rt. 2, Box 207A-D, Buffalo, TX 75831.



### **TAMIYA CARBON GRAPHITE CHASSIS SET**

MRC/Tamiya has now given us even more reason to own an Avante or Vanquish car—its new Carbon Graphite Chassis Set! Yes, a chassis made of this space-age material is now available for your R/C car to lighten and strengthen it for the rigors of racing. On the upper and lower decks, the chassis has been lengthened to produce a longer wheelbase (by about 15mm) that increases the car's ability to handle jumps. Unlike other companies that just sell a chassis plate and nothing else, MRC/Tamiya gives you a longer front-propeller joint, a motor mount, a rear-shock tower, new suspension arms, screws, nuts, bolts and clips so you can finish the conversion in one sitting.

For more information, contact MRC, 200 Carter Drive, P.O. Box 267, Edison, NJ 08818.



### **DAN'S RC STUFF GOLD BARS**

Move up to the 24-karat Gold Standard! These solid-copper, 24-karat gold-plated bars help you get maximum power out of your matched battery packs! Lighter and stronger than braid, they're a snap to use. Just pre-tin the bar, filling the hole with solder, then pre-tin your batteries as usual, adding one of the included insulator rings over each "+" end. Place the assembled pack on its side, place a "Gold Bar" on top (in its mounting position), and gently press the center down with a wooden stick. Apply your soldering iron and you're done!

Part No. 10027. Price: \$5.

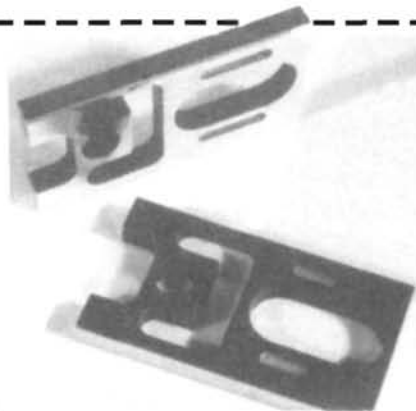
For more information, contact Dan's RC Stuff, 9525C Cozycroft Ave., Chatsworth, CA 91311.



### **NERON ASSOCIATES DYNA-PARTS PADS**

Dyna-Parts Pads are 3x6x1/16-inch magnetic sheets with vinyl backing. To avoid losing small metal parts, e.g., body clips and small wrenches, in your toolbox, put the Pads in your toolbox drawers. You can also use the Dyna-Parts Pads on your workbench to keep small metal pieces together while building or repairing.

For more information, contact Neron Associates, P.O. Box 348, Germantown, MD 20874.



### **COMPOSITECRAFT HYPERDRIVE MOTOR PLATES**

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For more information, contact CompositeCraft, Inc., 2400 Sand Lake Rd., Orlando, FL 32809.



### **STAGE III ULTRABRAID & WIRE**

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Super 13 wire is available in orange, black and blue coating: 25 feet, \$30; 50 feet, \$55; 100 feet, \$100. Ultrabraid Price: 50 feet, \$90; 100 feet, \$160.

For more information, contact Stage III, 1189 Chicago Rd., Troy, MI 48083.



# WHAT'S NEW

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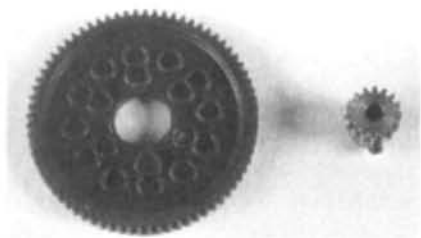


## TRINITY HOLE SHOT

Trinity's new Hole Shot motor spray is great for chemically altering the performance of your stock or modified racing motors. This spray has been dyno-tested and run for more than a year by the Trinity team drivers, so you can be sure it's a most effective product. Holeshot not only makes horsepower *on* the track, but it also helps *off* the track. After replacing your brushes, a little shot on the armature will lubricate it and prevent the brushes from arcing and glazing. Holeshot is available in 7-ounce spray cans.

Part No. 4035. Price: \$6.99.

For more information, contact Trinity, 1901 E. Linden Ave., Linden, NJ 07036.



## BOLINK 48-PITCH GEARS

BoLINK now stocks a complete line of 48-pitch steel pinion gears and precision-molded 48-pitch differential gears. The 48-pitch gears are smoother and give a wider ratio selection than the coarser 32-pitch gears, but they're stronger and much easier to work with than the finer 64-pitch type.

For more information, contact BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.



## PARAGON RACING PRODUCTS MODIFIED MOTORS

Now equipped with some of the industry's most contemporary equipment, Paragon has spent the last eight months developing built-to-specification precision motor-building apparatus. The result?—a beautiful line of super-bred modified motors! Each unit is wound and built manually, and the commutators are diamond-trued to a concentricity run-out tolerance of no more than .00005 (50 millionths). Each armature is ultra-high-precision balanced (to the point where a piece of foil tape the size of a pin head will throw it off). All magnets are zapped, and high-grade brushes are installed. The motors are put on a dynamometer and the timing is set to yield optimum performance. Two premium-quality capacitors are also included with each motor. To cover all types of competition, Paragon offers 24 different types of modifieds, and custom winds are also available.

For a catalog, send \$2 to Paragon Racing Products, Dept. CA2, 8802 Knollwood Dr., Eden Prairie, MN 55347.

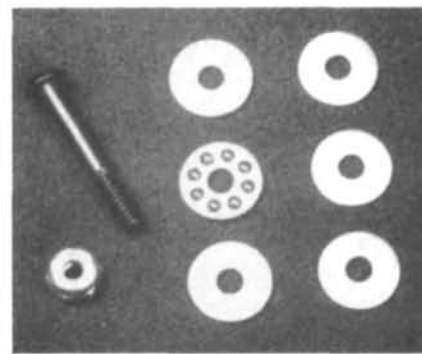


## MPE AVENGER SCE

A new high-capacity battery pack, the Avenger SCE offers R/C enthusiasts

much longer running times and all the power they expect from battery packs with SCR construction. The Avenger's features include a typical capacity of 1600mAh and the ability to charge and discharge rapidly. Maximum power is available to the motor, and this gives longer running times at maximum voltage. The Avenger SCE is assembled using computer-matched and graded cells, and it has low, internal, cell resistance for high-current discharge. It's available in standard and custom configurations to fit virtually any R/C model, and it's ideal for on-road and off-road use.

For more information, contact MPE Technologies, 15125 S.W. Knoll Pkwy., Bldg. 46, Beaverton, OR 97006.



## TEAM LOSI HEAVY-DUTY THRUST BEARING

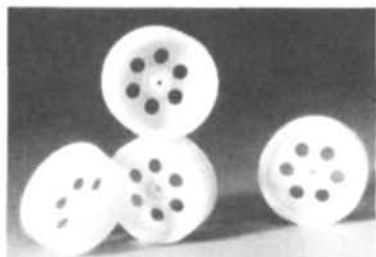
Team Losi has developed a special super-duty differential thrust bearing for its national champion, the JR-X2. Although originally designed for the new modified monster trucks, this unit easily exceeds the requirements of all types of off-road racing. The bearing portion is made of special phosphorus bronze with eight grade-25 balls. Ultra-hard ground-thrust washers give exceptional longevity and durability. The all-new Bellville washers and special, shouldered, adjustment screws give a full 1 1/2 turns from slip to lock-up. Needless to say, this makes diff tuning simple and reliable.

Part No. A-3018 (Heavy Duty Thrust Bearing).

For more information, contact Team Losi Inc., 1655 E. Mission Blvd., Pomona, CA 91766. (Continued on page 142)

# WHAT'S NEW

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Radio Control Car Action**, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Radio Control Car Action**.



## PRO-LINE 2.1-INCH-DIAMETER FRONT WHEEL

Pro-Line, which manufactures the ultimate, true, precision racing wheel, has just added the name of another winner to its roster. The new 2.1-inch-diameter front wheel (Pro-Line No. 2530) is molded from premium-grade nylon copolymer. Designed to fit Kyosho and Tamiya 4WD vehicles, this ultralight, durable wheel can be dyed to match your color scheme.

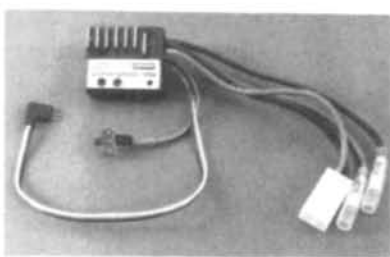
For more information, contact Pro-Line, P.O. Box 456, Beaumont, CA 92223.



## HORIZON DYNAMITE BATTERIES

Dynamite batteries are now available with a clever end-cap design that allows the lead wires to be located horizontally or vertically without chafing. This makes these batteries perfect for cars like the RC10, where battery cups can put tremendous strain on ordinary batteries. Expanding the selection of top-quality Sanyo-cell battery packs, the latest pack is a 7-cell hump configuration that's perfect for the RC10/TQ10. The Nitro Stick pack uses high-performance, economical, Sanyo KY cells, while the Nitro Stick XL uses Sanyo's special SCE cell for extended run times.

For more information, contact Horizon Hobby Distributors, 3102 Clark Rd., P.O. Box 6029, Champaign, IL 61821



## KYOSHO SC1000 ELECTRONIC SPEED CONTROL

The new Kyosho SC1000 Speed Control is a must for experienced racers. In addition to separate neutral and high-point adjustments, the SC1000 allows you to adjust response sensitivity to specific motors and a variety of track conditions. An LED adjustment light makes set-up easy. The SC1000 works with 5 to 8 cells and operates at 210-amp continuous current with a 1260-amp peak. Voltage drop is low: .004 V/A. It measures 1 1/2 x 1 5/16 x 9/16 inches and weighs only 1.4 ounces.

For more information, contact Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.



## FINE DESIGN STREAMLINER 1/10-SCALE RAIL DRAGSTER

This is Fine Design's newest drag car, and it comes with a graphite chassis that's light and has controlled flexing. The rear motor pod is machined aluminum for precise bearing alignment, and it also acts as a heat sink for the motor. The front axle is aluminum, castor-adjustable and spring-loaded.

The steering system has a bellcrank, so the servo can be mounted where it produces the best weight transfer. This kit comes with a highly detailed, clear Lexan body and a graphite wing. Standard equipment includes: aluminum rear wheels with trued-and-glued, one-piece,

foam rubber tires, aluminum front wheels, front and rear bearings, mounting hardware, spur gears and pinion gears.

For more information, contact Fine Design & Mfg., 2 North St., Middletown, NY 10940.



## ASTRO FLIGHT CHARGERS

The Astro Model 112 DC/DC charger is specially designed to charge big electric systems quickly. There's no more waiting around for hours trying to charge the battery packs you use in electric dragsters, sled pullers and high-performance electric boats.

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The input cord is both fused and diode-protected, so if you inadvertently hook up the alligator cord backwards, nothing will get fried. Just pop in a new 20-amp fuse, and you're back in business. With the voltage jacks on the front panel, you can monitor the charging with your digital voltmeter.

For more information, contact Astro Flight, 13311 Beach Ave., Marina del Rey, CA 90292.





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## DIRT OVAL NATS

(Continued from page 132)

were in the 6.20- to 6.45-second range, while those of Landgraff and Darby ranged from 6.45 seconds to 6.70 seconds.

Even when Soderquist had crossed the line 1st, there were rumblings that the victory would be given to Brian Landgraff. Rumors flew about protests and lawsuits, because at first, it appeared that

Soderquist hadn't marshalled for one of his assigned heats, and this would lead to one lap being taken off his Main total.

After all kinds of threats (including those about changing car sponsorships), Eric Gudger, ROAR president and race representative, explained the whole situation. Soderquist had apparently sent someone else to turn marshall for him, and ROAR rules allow this. As part of their job, track employees had noted that Soderquist wasn't at his assigned spot, but

they said nothing about this until everything was over. While a lengthy discussion took place, Soderquist agonized about the possibility of losing the National Championship. It was finally decided that since his replacement was at the track, the lap wouldn't be deducted from his total, because his actions were legal according to ROAR rules.

Since Jerry Landgraff had been consulted frequently during all this, some

(Continued on page 151)

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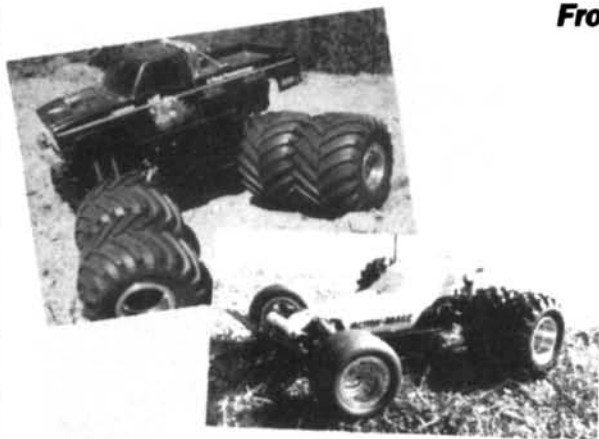
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## DIRT OVAL NATS

(Continued from page 144)

thought he was protesting on Brian Landgraff's behalf, but as ROAR's dirt-oval director, he was impartial and wasn't protesting the outcome. Everyone calmed down as soon as this was made known.

The '89 ROAR Dirt Oval Nationals champs are:

- 2WD Stock: Sammy Blackwell

- 4WD Stock: Warren Darby

- Sprint: John Smith

- 2WD Modified: Cliff Lett

- 4WD Modified: Erik Soderquist

Thanks to CRP, Progressive Technologies, Team Pit Stop, Custom Works, JG Manufacturing and Trackmaster for their sponsorships, and special thanks to Margaret and Dave Guerin who did their best to make the races run smoothly.

Finally, the curtain fell on the '89

ROAR Dirt Oval Nationals, and despite the weather forecasts, I haven't had to write about boats at all! ■

## RC10 CONVERSION

(Continued from page 119)

ner. After all, it's a monster truck, and they're *supposed* to act weird and jumpy, but this one had all the manners of an

(Continued on page 160)

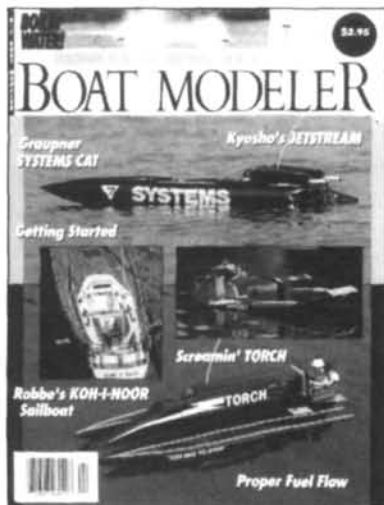
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## RC10 CONVERSION

(Continued from page 151)

English butler.

So I pulled a stock RC10 out of my bag of tricks (Felix the Cat has nothing on me and my satchel) and ran it over the same course. Wouldn't you guess that the car was just as easy to drive as the truck! I had no choice but to place the blame for my disappointment on the excellent engineering of the chassis and suspension.

And that brought me to one undeniable conclusion: This RC10 conversion shouldn't be wasted on truck pulls and simple ground-pounding. Pro-Line has made the right choice by including a stadium truck body. This is a racing truck, big wheels and all.

**WHAT'S NEXT?:** So now I'm stuck with a primo racing truck wrapped around a world-class racing car. Boy, do I feel bad about that! Of course, my wallet will start moaning pretty soon. Having bought a basic kit, my truck is starting life as a blank canvas. If I decide to get serious about it, I can always add some Andy's\* front arms, a Bullet Racing\* graphite chassis, an MIP\* transmission, most definitely a front bumper, and a heck of a lot of ball bearings (you see, my objection to the RC10 had nothing to do with the car's

quality; it's just too easy to throw \$200 to \$400 into it with extras). It's sort of the same feeling I had when I bought my bare-bones van back in '72. Anyone know how to mount a sink in the back of a stadium truck?

*\*Here are the names of the companies mentioned in this article:*

**Pro-Line**, P.O. Box 456, Beaumont, CA. 92223.

**MRC/Tamiya**, 200 Carter St., P.O. Box 267, Edison, NJ 08818.

**Andy's R/C Products**, 466 West Arrow Highway, Unit K, San Dimas, CA 91773.

**Bullet Racing Products**, 14435 Tomball Pkwy, Houston, TX 77086.

**MIP**, 838 Edna Place, Covina, CA 91723.

## TRACK DIRECTORY

In keeping with our constant efforts to help foster the growth of the radio-control car hobby, we've decided to run this track directory intermittently to inform modelers where they can race and exchange ideas. If you'd like your track listed, send us your name, address, phone number and some information about the track to **R/C Car Action Track Directory**, 251 Danbury Road, Wilton, CT 06897. We'll list as many clubs as space allows.

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(Continued on page 164)

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(Continued on page 168)



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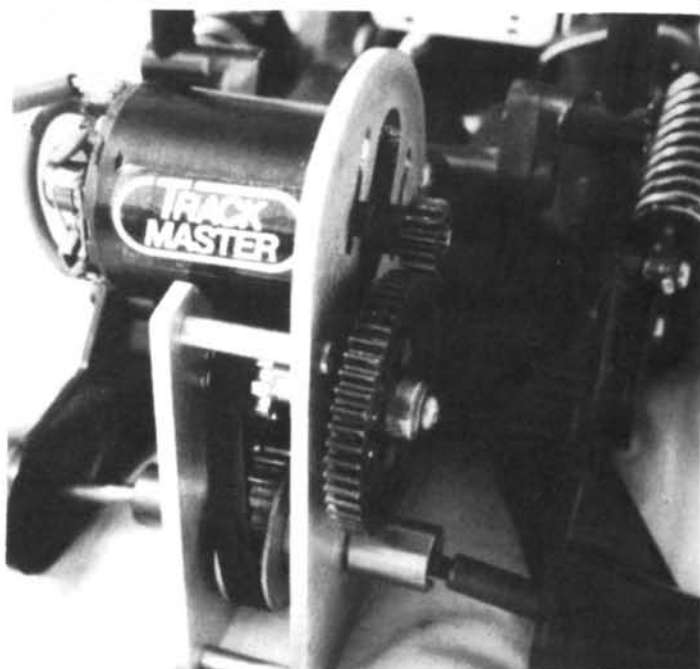
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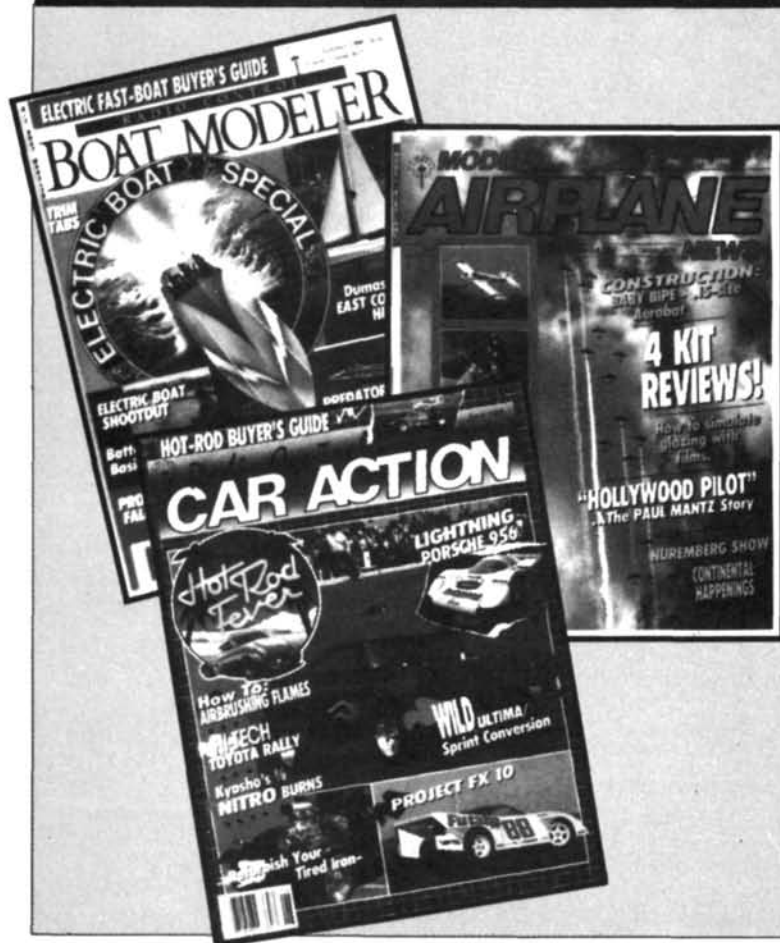
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# CAR ACTION EAST-WEST OVAL SHOOTOUT

## RC Thunderdrome Amateur Entry Form

September 1,2,3 (Labor Day weekend)

Entry Fees: \$40, Modified Classes  
 \$40, Stock Class with handout motor

Amateur entries limited to 200  
 (only one entry per person)

Entry deadline: August 15, 1989

- .....
- |   |  |
|---|--|
| <input type="checkbox"/> Direct-drive Stock (ASA bodies)<br>6-cell, handout motors, 4 minutes             | <input type="checkbox"/> Gear-case Modified (Outlaw or wedge bodies)<br>7-cell, modified motors, 4 minutes |
| <input type="checkbox"/> Direct-drive Modified (Winston Cup bodies)<br>7-cell, modified motors, 4 minutes | <input type="checkbox"/> Road Wizard (Stock Wizard bodies)<br>6-cell, modified motors, 4 minutes           |

(NARA Sanctioned)

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ Freq. 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

Make checks payable to: **RC Thunderdrome**

Mail checks and entry forms to: **McAllister Racing,**  
 2205 First Street #107, Simi Valley, CA 93065

Any R/C car industry manufacturers interested in participating in the Pro Class with racers or sponsorship, please contact Gary at McAllister Racing.

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(Continued on page 191)

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Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

## CAR ACTION EAST-WEST OVAL SHOOTOUT

### Lake Whippoorwill Amateur Entry Form

**3rd Annual Radio Control Car Action Weekend Race of Champions**

**October 13, 14, 15**

**Entry Fees: \$40, Modified Class**

**\$40, Stock Class with handout Trinity Speedworks Motor**

**Amateur entries limited to 150 Stock, 100 Modified  
(only one entry per person)**

**Entry deadline: September 30, 1989**

☐ 1/10 Stock (ASA bodies) 6-cell, handout  
motors, 4 minutes

☐ 1/10 Modified (Winston Cup bodies) 6-cell,  
modified motors, 4 minutes

**(NARA Sanctioned)**

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ Freq. 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

Make checks payable to: **Lake Whippoorwill  
International Speedway**

Mail checks and entry forms to: **Lake Whippoorwill  
International Speedway, 12345 Narcoossee  
Rd., Orlando, FL 32827**

Any R/C car industry manufacturers interested in participating in the Pro Class with racers or sponsorship, please contact Bob Hosch at (407) 277-9586.

☐ Check here if you need information on campground reservations

**PRE-ENTRIES NON-REFUNDABLE**



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(Continued from page 187)

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(Continued on page 192)

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(Continued from page 191)

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for more Track Directory!**

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